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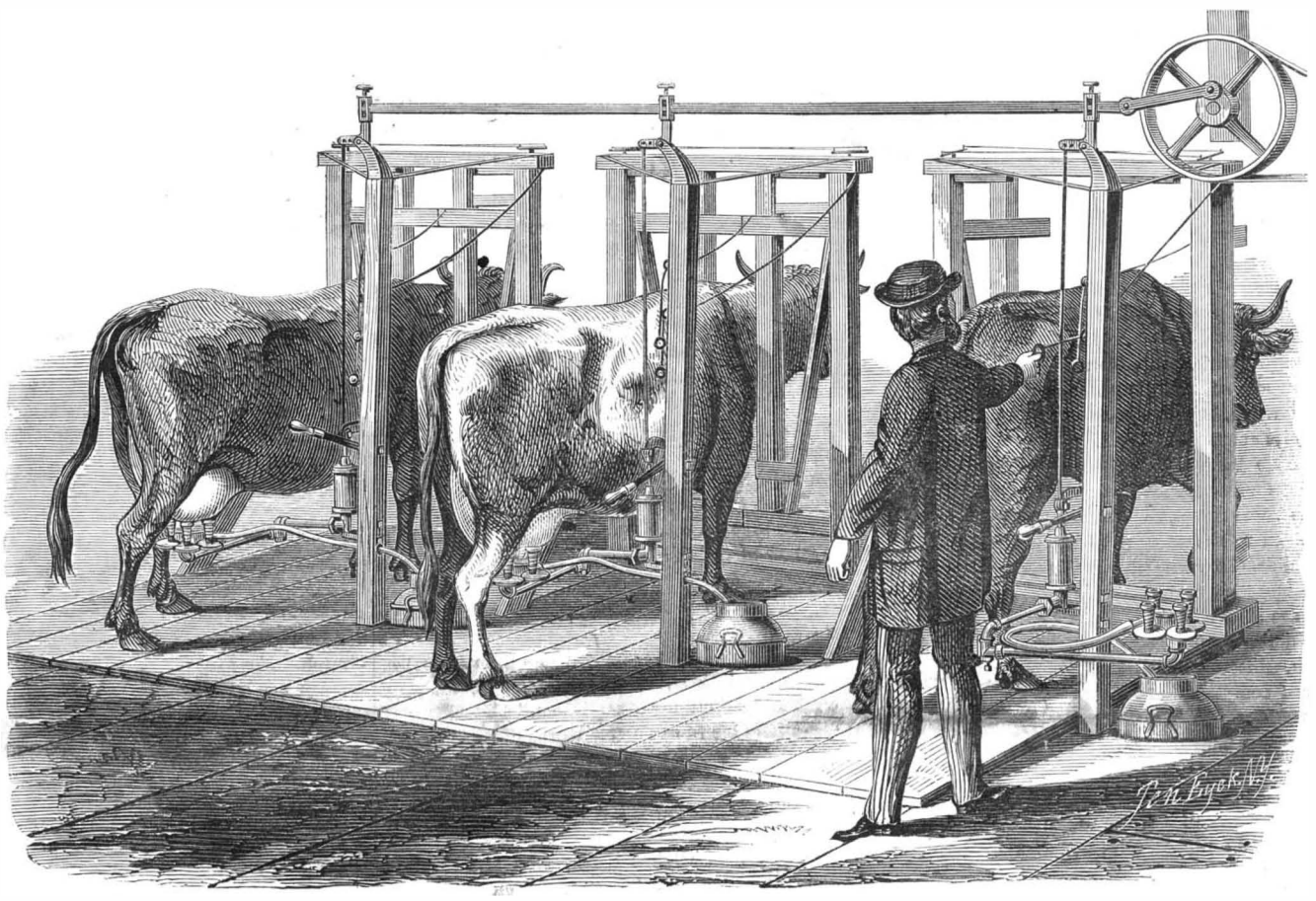
Hydraulic Cow Milking Machine.

Every dairyman knows the trouble and labor of milking a dairy of cows by hand, and the difficulty of procuring good milkers, who will always milk the cows alike, clean, quickly, and thoroughly, with comfort to the animal. They have experienced the aching of hands and been troubled with kicking cows. There is no labor done on the farm more uninviting and monotonous; yet it cannot be delayed or put off to a "more convenient season." While machinery has been adapted to the manufacture of butter and cheese, the labor of milking has heretofore been left to muscular exertion alone; the Hydraulic Cow Milker, however, which is illustrated in the engraving is intended to relieve the farmer from the irksome work of hand milking.



COLVIN'S PATENT HYDRAULIC COW MILKER.

The accompanying engraving is an illustration of three machines operated with power and attended by one man; two machines, each milking a cow, and one turned back out of the way, for the cow that has been milked to pass out to make way for another to come into the stall to be milked, not stopping the power while changing the cows. The stanchion is the same as any ordinary stanchion, with the exception that it opens out to let the cow pass through to facilitate the changing of cows. In this manner cows can be very quickly brought to the machine,—occupying less time than it would to go to the cow in the yard or stable.

The cows soon learn to come to the machine if fed or salted a few times while being milked. The milk runs into large cans partially sunk in the floor. Three machines are sufficient to milk sixty cows in the time it would take six men to milk them by hand, and one man can attend to all the machines, which may be run by hand, dog, or other power.

The milkers are worked by pumps, the pistons of which are driven by power. They are attached by a jointed iron pipe to allow of the movement of the cow forward, backward, or sideways, always adapting itself to her motions. The teat cups are of corrugated rubber closely enveloping the teats, and will fit those of any cow. The pumps oscillate, giving the natural motion of the calf in sucking or of the hand in milking; the space between the elastic diaphragm in the milker and the pump being, filled with water, which in working the pumps, oscillates in the tube and produces a vacuum at each alternate stroke of the piston. No dust, hairs, or dirt can possibly find their way into the milk while passing to the receiving cans. The machine has been exhibited in this city and attracted considerable attention. Having witnessed its practical operation, we are willing to add our testimonial to that of others in regard to the facility of working and the apparent value of the machine. Its operation appears to be as agreeable to the cow as it is effective in saving time and labor.

Patented May 22, 1866, and Feb. 18, 1868; patents for minor improvements now pending through the Scientific American Patent Agency. All orders or communications for information should be addressed to the Hydraulic Cow Milker Manufacturing Co., No. 1 Vesey st., Astor House block, New York city.

THE CHEMISTRY OF TOBACCO.

Since the days of Sir Walter Raleigh this plant has had its partisans and its strong opponents, but we have never learned that any arguments on the subject have ever effected the conversion of a single individual from the prejudices which he may have entertained for or against it. A quotation from the pen of an eminent medical historian on this subject may not be devoid of interest. "This most extraordinary plant, notwithstanding its powers of fascination, has suffered many romantic vicissitudes in its fame and character; it has been successively opposed and commended by physicians—condemned and eulogized by priests and kings—and proscribed and protected by governments—while at length this once insignificant production of a little island, or an obscure district, has succeeded in diffusing itself through every climate, and in subjugating the inhabitants of every country to its dominion. The Arab cultivates it in the burning desert—the Laplander and Esquimaux risk their lives to procure a refreshment so delicious in their wintry solitude—the seaman, grant him but this luxury, and he will endure with cheerfulness every other privation, and defy the fury of the raging elements—and in the walks of civilized society, at the shrine of fashion, in the palace and in the cottage, the fascinating influence of this singular plant commands an equal tribute of devotion and attachment."

Of the plant known by the generic name of *Nicatiana*, there are three principal species, which are essentially the same in their general characteristics, but somewhat different in a few of their minor ones, and these are all called by the common English name of *tobacco;* by the French, *tabac;* by the Germans, *tabak;* and by the Spanish *tobaco*. It was called Nicotiana in honor of John Nicot, an embassador of France at the Court of Lisbon, who introduced it into the former country in the year 1560, one year after it had been sent into Spain and Portugal by Hernandez de Toledo, at which time, as far as historical record can be relied on, it was first introduced into the continent of Europe. Twenty-five years afterwards, in 1585, it was brought by Sir Francis Drake from Tobago, one of the windward group of the West India Islands, which originated the common name of tobacco. Other historians, however, derive the name from Tabasco, one of the provinces of Yucatan, where it is said to have been found by the Spaniards. In 1589 it was carried from Spain into Italy, by the Cardinal Santa Croce, and from these countries soon after found its way throughout the entire continent. A superior quality of tobacco is a native of China, and is thought to have been cultivated in Asia long before the discovery of America by Columbus. The best Cuba tobacco is obtained from the same species.

Tobacco leaves contain, besides the peculiar principles which we will presently examine, nearly 3 per cent of a bitter extractive matter, about 5 per cent of lignin, nearly 88 per cent of water, with variable smaller quantities of silica, gluten, albumen, resin, starch, and several salts of lime, potash, and ammonia, in the form of phosphates, sulphates, nitrates, chlorides, and malates, though in this plant the malic acid goes by the name of nicotic acid. The characteristic alkaloid obtained from tobacco is called *Nicotin*, $C^{20}H^{14}N^2$—162. It is prepared by distilling 500 parts of smoking tobacco with 6,000 parts of water, and 200 parts of caustic soda, and receiving the distillate in a flask containing about 40 parts of sulphuric acid in three times its weight of water, continuing the process till about 3,000 parts have come over. This is evaporated to about 100 parts, maintaining a slight excess of acid throughout the process. It is again distilled with an excesss of caustic soda, and concentrated *in vacuo*, during which it gives off ammonia and assumes the consistence of a yellowish sirup, from which, in a few days, are formed minute crystals or plates of nicotin, but which are hygroscopic to such a degree as to prevent their being kept in that form. It is soluble in all proportions in water, and still more so in alcohol and ether. It is soluble in 40 parts of oil of turpentine, and in oil of almonds, which, by being shaken with acetic acids, is entirely absorbed by the latter. Olive oil also dissolves it. With the acids it forms salts, which are generally soluble in water and alcohol, but insoluble in ether. It unites with gallo-tannic acid, forming a salt which is but slightly soluble, and has therefore been suggested as an antidote against the effects of the alkaloid in the system.

In its action upon the animal economy, it is one of the most powerful poisons that is known in the vegetable kingdom, a few drops of its concentrated solution being sufficient to cause a destruction of life in man in from two to five minutes. The oil of tobacco, obtained by the distillation of the cured leaves at a temperature above that of boiling water, contains a large proportion of nicotin, and is therefore poisonous. Tobacco pipes or cigar tubes, when long used without cleaning, contain a considerable portion of this oil, and give the peculiar smell and acrid taste which are so disagreeable to the uninitiated. The finest qualities of Havana tobacco contain 2 per cent of nicotin, the Virginia and Connecticut about 6 per cent, and that which is raised on the soil of France a high as 9 per cent.

Another principle found in tobacco is called *Nicotianin*, $C^{46}H^{32}N^2O^6$, and is the true aromatic essence of the plant, or tobacco camphor. It is obtained by distilling the fresh leaves, with their weight of water, and repeating the process two or three times. It is a fatty substance, having the odor of tobacco smoke, and an aromatic, bitterish taste. It is sparingly soluble in water, soluble in alcohol and ether, and in liquor of potash, but unaffected by the dilute acids. It is soluble, with decomposition in hot nitric acid. To the presence of this substance, and the comparative absence of the alkaloid nicotin, is due the value of tobacco for smoking purposes.

When chewed, tobacco has sometimes been know to produce symptoms of delirlum tremens and paralysis, but these cases are rare; it is sometimes recommended in rheumatism of the jaws, and in toothache.

During the process of curing and preparation for use, tobacco leaves undoubtedly undergo a great chemical change, generating, as the process does, a much greater proportion of nicotin and nicotianin.

The best qualities of the prepared leaf have a rich velvety brown appearance, and comparatively small leaf veins, while these in the inferior qualities have a coarse, woody appearance, and when burnt emit a disagreeable empyreuma like that of burning wood or straw. Of its various uses in medical practice we need say nothing in this connection. Its consumption for the several purposes of chewing, smoking, and snuffing, in almost every civilized country, is sufficient to almost exceed the belief of the most credulous, and the revenue to their respective governments, from its importation, manufacture, and sale, is second to that of very few other productions.

Sulphureted hydrogen and hydrocyanic acid have been detected in very minute quantities in the smoke of tobacco, but do not exist already formed in the plant. The former is doubtless derived from the sulphate of potash and the hydrogen of some of its elements, and the latter from the carbon and ammonia.

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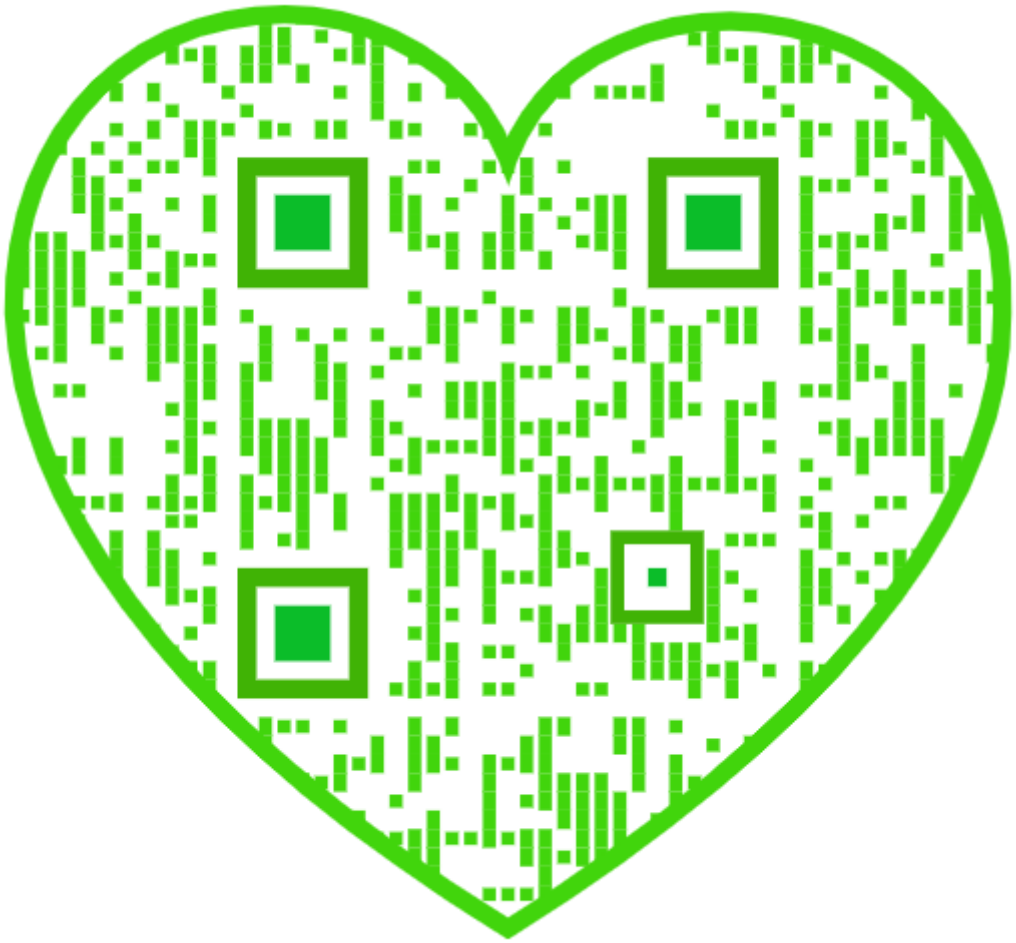

Among the various adulterations to which chewing tobacco is subject, are lead, copper, antimony, copperas, black hellebore, alum, sugar or molasses, dock leaves, and corrosive sublimate. These are added to give flavor or pungency to the weaker and poorer varieties, and the legitimate effects of such villainous compounds need not be mentioned. Too much of the "fine cut chewing tobacco" is wrapped in an inferior kind of tin foil, having a great proportion of lead in its composition, and partial paralysis of the tongue and muscles of the mouth has followed its use, from the lead salts thus formed, when the simple use of the tobacco in its pure state would have failed to produce results so deleterious.

For chewing purposes, an article called British herb tobacco has been substituted for the genuine "weed," and is composed of thyme, marjoram, and hyssop, of each two ounces; coltsfoot, three ounces; betony and eyebright, of each, four ounces; rosemary and lavender, of each, eight ounces; the whole mixed, pressed together and cut in the form of plug tobacco. It is harmless, cheap, and among the poorer classes answers a good purpose. For smoking purposes, the bark of the cascarilla is sometimes added to impart a peculiar flavor, and the leaves of various other plants are sometimes substituted in part for those of the tobacco. Niter is sometimes added to make it burn more rapidly, though it is frequently found in small quantities as a product of the chemical process of curing the plant. Potash, as before observed, exists already formed as one of the component parts of tobacco, aside from the trace of the nitrate which it contains, and in the usual process of preparation a weak solution of potash, or its carbonate, is also sprinkled upon the leaves, and it is not unlikely that while being dried they may absorb a portion of nitrogen and oxygen from the atmosphere, sufficient to form a small amount of the nitrate.

Snuff-taking, though at one time almost a universal practice, has now fallen greatly into disuse, though in some of the Southern and Western States, and among the Spanish dames of the West Indies, the disgusting habit of chewing snuff, or as it is called "dipping," is still followed to a great extent. Medicinally, it is recommended for colds, catarrh in the head, and several other purposes. Snuff is usually adulterated with salt, for the purpose of increasing its weight and keeping it moist, and with urine, muriate of ammonia, and powdered glass, to increase its acrimony and pungency. Some kinds are moistened with cane juice or molasses and water, which gives rise to the vinous fermentation, and rum is sometimes added to produce the same flavor. Quicklime or caustic alkali is sometimes added to the tobacco to develop the flavor as well as to neutralize the acid formed in fermentation.

Many other substances are also added, either to color or flavor, thus forming the different varieties of Scotch, Welsh, Spanish, Lundyfoot, French, Russian, Strasburgh, Maccoboy, and many others. They are sometimes medicated with subsulphate of mercury, nitrate of silver, etc., for catarrh, headache, inflammation of the eyes, and other diseases of the nerves of the head, the mucous membrane of the nose, etc.

The use of tobacco for snuffing and smoking had arrived to such a pitch in 1624 that Pope Urban excommunicated all who were detected taking snuff in the church, and in 1634, the penalty of having the nose cut off was executed against all smokers in the Russian Empire. In 1653, the council of the Canton of Appenzell, Switzerland, ordered all innkeepers to inform against such as were found smoking in their houses, and when so detected, the culprits were severely punished. As late as in 1719, the Senate of Strasburgh prohibited the cultivation of tobacco from an apprehension that it would diminish the growth of corn. In other places its use in any form has been made a capital offence, as it was thought to be adverse to fecundity.

To most of the lesser animals, insects, worms, etc., this plant acts as a virulent poison, and for this reason its decoction is often used to destroy parasites on animals and plants. —*Journal of Applied Chemistry.*

EDITORIAL CORRESPONDENCE.

Rome to Venice—Pistoja and across the Appenines to Bologna —The Portico and Chapel of St. Luke—Splendid Campo-Santo. How the Dead are Buried—Approach to Venice—The Carnival—The Church and Piazza of St. Mark—Other Sights of the City.

Nothern Italy, Feb. 1868.

The country between Rome and Leghorn is a wearying monotony, but from Leghorn to Lucca and to Pistoja, situated at the base of the Appenines, it is charming and extremely picturesque. The soil is very rich, the hills are covered with vines, olives and chestnuts, and I was informed that nowhere in Italy could be found a more laborious and intelligent people. A good degree of improvement seems to have existed for a long time in this section, which never would tolerate any Jesuits.

Pistoja is an old walled town, situated at the foot of one of the spurs of the Appenines, and enjoys the enviable reputation of being the first place where pistols were made, which bear the patronymic or family name. Having a couple of hours leisure on hand before the departure of the connecting train for Bologna, we improved the time by a carriage drive through the town. There are, as usual in such places, some fine old churches and palaces; but the most noticeable feature as the dull and sleepy appearance which seemed to hang over every visible object. The rumble of our carriage wheels over the smooth pavement fairly set the people to rubbing their eyes. They poked their heads out of the shop doors, and even stopped in the streets—the few that chanced to be wandering there—as if surprised to see and hear so much real life and noise. I have never yet been able to discover how several thousand people manage to keep soul and body together in some of these wofully stupid European cities.

A little, shriveled-up *laquais de place* begged of us to permit him to show us the Cathedral, on the plea that "a fellow must live somehow," but how? that was the mystery that puzzled us. He seemed to be happy when we gave him a half-franc without asking him to show us the Cathedral, which stood before us visible to the unassisted eye.

About two miles beyond Pistoja, the railway begins to ascend the mountains, through tunnels and over bridges, the whole forming the most stupendous piece of engineering that I have yet seen. The grades are very sharp, and at some places in the long, winding tunnels it was with the utmost difficulty that the locomotive could crawl along. The train occupied two hours in getting to La Porreta, a distance of about nineteen miles. Here we encountered the snow and chill of winter, which continued to Bologna, the streets of which were piled up with embankments of snow nearly five feet high. It was a strong contrast to what we had witnessed only two hours before, upon the plains, where we saw the trees budding, the vegetables green in the gardens, and the farmers busy with their plows, preparing the soil for the seed. Some antiquated writer has described Bologna "as chiefly famous for its sausages and fine dogs;" but to my taste the sausages are not remarkable, and as for the dogs, I should say that they are of about the usual quality of Pupdom generally. Bologna, however, is a fine old city, one of the most remarkable, in many respects, in Italy. It possesses really magnificent palaces and churches, some fine monuments, a gallery of pictures, which contain many excellent examples of the Bolognese school, and a Campo Santo, or burial place, which surpasses any thing of the kind in Europe, and attests the refined character of the people. This Campo Santo may very properly be called a gallery of the dead, as all the fine tombs and monuments are arranged in extensive galleries for form a sort of holy museum of art. Between the galleries are several large open courts for the burial of the humbler classes, who have not the means necessary to provide for a more elegant interment. A portion of the building, together with the church, were once an extensive monastery, to which additions have from time to time been made, as one after another have been borne to the palatial mausoleum.

In connection with the Campo Santo, there is a large vaulted chamber designed to receive the marble busts of eminent citizens. I was curious to see the head of Mezzofanti, who was once a professor of Greek and oriental literature in the celebrated University of Bologna. At the time of his death, in 1849, he could converse in forty-two different languages. Byron says, "I tried him in all the languages of which I knew only an oath, or abjuration of the gods against pirates, savages, boatmen, muleteers, camel-drivers, etc., and, by Heaven! he puzzled me on my own idiom." Speaking of Campo Santos reminds me to say a few words of the Vecchio, at Naples, where the dead poor are thrown indiscriminately into pits, of which there are 366 in number, one for each day in the year. The pits are constructed under the pavement, about twelve feet square and sixty feet deep, and are covered by a large stone, provided with a strong iron ring, and by means of a lever resting upon a fulcrum, this stone cover is lifted from its seat. The bodies, usually naked, are brought to the pits in coffins, provided with hinged lids, and upon being removed they are let fall one by one, feet foremost, dropping upon a layer deposited a year previous. The pits are never cleared out, which explains in part why a different one is opened each day. Some writers have declared that quicklime was employed to dissolve the bodies, but this, I was informed, was not true. The practice surely is melancholy enough without the addition of this repulsive feature. How much more refined the pagan mode of burning the dead upon a funeral pile, and afterwards carefully collecting the ashes in urns, and then depositing them in the Columbaria, as in the time of ancient Rome—patrician and plebian all sharing alike. But still more refined is the true Christian burial, in a quiet spot, far removed from the danger of being hustled about in premature resurrection, by the opening of some new street or railroad.

The people of Bologna cherish the pious belief that they possess a miracle-working image of the Virgin, carved by St. Luke, who must have been a prodigious worker in wood, as there are numberless specimens of his skill in Europe. In order to give forcible expression to their faith, the Bolognese caused to be erected on the top of one of the surrounding mountains a fine church, which serves as a repository for the image. In addition to this they have incurred the enormous expense of constructing a covered portico, twelve feet wide and fifteen feet high, consisting of 635 arches, which commences at one of the city gates and extends up to the church, a distance of three miles. The religious sincerity of a people can scarcely be called in question, when they so freely spend their money to give it practical expression.

The railway northward, from Bologna to Venice, crosses the Po and Adige, and passes through the old cities of Ferrara, Rovigo, and Padua, the country being flat and fertile. A short distance beyond Mestre, at the junction of the road to Trieste, the railway approaches Venice, and crosses the lagoon upon a stone viaduct consisting of 222 arches of 32 ft. 9 in. span, the parapet being 14 ft. above water level. It was four and a half years in building, and serves the double purpose of a railway and fresh water carrier. What a strange city is this, and how beautiful is the first view. Appearing in the distance like a floating city, its domes, spires, cupolas and towers glittering in the sunbeams of a bright, cheerful day, one might easily imagine it one of those optical illusions presented by a mirage. Upon reaching the station we passed to the front entrance, where we were met by two gondoliers with blue sashes tied about their waists, who had been sent to bring us to the Hotel Europe. We moved down the grand canal, which runs through Venice in the form of a letter S, and constitutes the Broadway of the city, and to shorten the trip, we were turned into some of the narrower canals, and finally, after a ride of twenty minutes, were disembarked at the hotel, the front steps of which led directly to the edge of the grand canal, where gondolas are always in waiting to take in excursionists. At this point, also, the waters widen out toward the passages leading to the Adriatic.

From our window we enjoyed a most enchanting prospect. Within the line of vision, on the opposite side of the canals, we had fine views of the sumptuous church of Santa Maria della Salute, founded two centuries ago by a decree of the Senate of Venice, to commemorate the departure of the plague, which swept off 60,000 inhabitants. A little further down, upon another island, is the imposing church of San Giorgio—the church of the Greek rite, with its tall, brick campinale, and still beyond is San Lazaro, nearly covered by the building of an Armenian convent, where Byron studied this oriental language. Strange to say, this Christian convent, now in active operation, is protected by the flag of Mahommedan Turkey. Still further on is Lido, washed by the Adriatic, the spot selected by Byron for his own burial place. The whole picture, embracing a wide perspective of water and little islands, was very much hightened in the foreground by a spectacle which can only be witnessed at Venice. It was the opening day of the Carnival. The city was alive with fun and excitement. The little bridges and narrow footwalks were lined with people. Several hundred gondolas, usually black and funereal, now decked in the gayest trappings, and filled with joyous masquerading parties, were moving up and down the grand canal, the scene being enlivened by the strains of soft music, filling the ear with delicious sounds, while the eye feasted upon a scene of weirdlike enchantment and strange novelty. At sunset there was a temporary hush in the proceedings, the scene changed to starlight and gaslight, the effect of which, reflected on the water, was extremely pleasing and artistic.

The famous Piazzo San Marco is five minutes walk from our hotel. We can reach it through a narrow ally, or by gondola, but we prefer the passage by land, as the narrow streets leading to San Marco were to be filled that evening with masked people, dressed in grotesque and ridiculous costumes, and a grand carnival *bal masqué* was to take place in the open square, which we found most brilliantly lighted up for the occasion. There is no other spot like it in the world. On one side is the singular cathedral of St. Mark, in which are blended Grecian, Byzantian, and Venetian elegance and luxury, with an exterior resembling more a mosque than a Christian church. Near it stands the famous Ducal palace, a gloomy building, whose every apartment tells terrible tales of conspiracy, crime, cruelty, and blood. The doge who began it lost his head, and the architect was hung as a conspirator. Around the piazza, on three sides, are imposing buildings, projecting over to form arcades, and under which are fine shops and cafes, once the pride and luxury of the Venetians. Within this enclosure rises the majestic Campinale, or bell tower, 323 feet high, easily ascended by an inclined footpath without steps, and from which Venice is seen rising from the sea, with the crowd of surrounding islets, the Adriatic and the distant Alps—a sight to be forever remembered by those who are permitted to look upon it.

On the evenings of the Carnival, which continues through the week before Lent, the *piazza* is given up to joustings and frolicing. In the center is erected a large temporary platform for *bals masqué* and military concerts, and when the whole square is crowded with masqueraders, and lighted by thouands of gas jets and variegated lanterns, the effect is indescribable, reminding one of the enchantments in the stories of the Arabian Nights. The second evening was devoted to grand military music, commemorative of the battles of Magenta and Solferino, in which four superb bands took part, and to give a warlike effect to some of the more imposing parts, cannon were fired and rockets discharged. The crowd always behaved admirably. There was no crowding, no elbowing, no rudeness, no unnecessary noise; all seemed to be put upon their good behavior, and behaved with a pleasant regard for the rights of others. Such an exhibition would have been impossible in New York, where there are so many drunken, fighting rowdies.

I want to say a kind word in behalf of the pigeons of St. Mark, which have been a pleasing feature of Venice from its earliest days. During the government of the Republic they were fed every day from the public granaries, on the piazza of St. Mark; but when Venice was taken, in 1796, these innocent state pensioners were compelled to subsist upon private charity. Every day, the moment the great clock strikes two, the pigeons come flying in, from every direction, to get their rations. It is certainly a very interesting sight, and I hope the custom may not be forgotten.

What lover of the genius of Shakspeare could fail to be deeply interested in visiting the bridge of Rialto, the spot "where merchants most do congregate", and so little changed since the time of the Merchant of Venice that one might almost expect to see Shylock in his gabardine, holding parley with the noble Antonio and his friend Bassano. Here also is to be seen the house of Christoforo Moro, the Othello of Shakspeare. A statue adorns the front, which is supposed to resemble the Moor, as it has the shape and appearance of a well developed man, having a dark skin. In Venice also lived Marco Polo, the celebrated traveller; also, Titian, the great painter, whose marble tomb in the church of the Frari is one of the finest in Europe. Visit the doge's palace, wander about its stately and gorgeous apartments, ask the guard to conduct you over the Bridge of Sighs, upon which, tradition

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says, there was once an inscription like this, "Who passes here leaves hope behind." I looked for it in vain, and concluded that the idea must have been borrowed from Dante, in his passage through hell, where he beheld written in dark characters over the portal, the words,—

"Abandon hope, all ye who enter here."

Enter the Piombi, or prison house, so much abused for its horrid dungeons, some of which, it is said, were actually built under the water. I took pains to inquire about this, and was assured that it was not true. The guard conducted me to the lowest cells, as he said, and I noticed that some daylight came through a small window above the surface of the water. The Piombi is bad enough, but no worse than many other European prisons of the middle ages. Enter St. Marks church, and examine its tessellated pavement of porphery and jasper, also its wonderful mosaic ceilings, in gold and colored marble. Look at its rich treasures, and examine the extraordinary collection of sacred relics, such as "sand that contains a few drops of the blood of Christ;" "a piece of the true cross and one of the nails;" "two of the thorns that pierced his brow;" "a small piece of his garment;" "some hairs of the Virgin;" "three stones that were thrown at St. Stephen;" "a piece of the pillar to which Christ was tied" (the original was shown to us in St. Stephen's church, in Bologna); "the thumb bone of St. Mark;" "the ring that he wore and the chair upon which he sat;" "the skull of St. Philip," and other rare things—such as precious stones, gold and silver vessels, and jewels of great value. All these things, and much more besides, which I cannot now enumerate, combine to make Venice one of the strangest and most interesting cities in the world.

Aside from the gorgeous decorations of St. Mark, it is supposed to contain the body of the evangelist whose name it bears. To use a mild term, the remains were *translated* without permission from Alexandria; for to say that they were stolen would be equivalent to charging a crime upon those Christians who piously perpetrated the deed.

Venice is a still city. No carriages can rumble through its narrow streets, and no other animals but mankind, cats, and dogs, are to be seen. Its ancient splendor is passing away, and ruin seems to be written upon its every feature.

S. H. W.

[By a comparison of dates, the reader will notice that the foregoing letter was written before the one which appeared in our last week's issue, but we publish it on account of its interest, and to complete the series.—EDS.

For the Scientific American.

THE MANUFACTURE OF FRENCH LEATHER.

To learn the secret of making French leather, or what is popularly known as fine fancy leather, has been a source of anxiety to the tanners of other nations for many years. Schemes have been thought of for the discovery of the mystery by leather manufacturers and others, but they have been hitherto unsuccessful. Chemists have been called in to solve the question and though analyzing air, water, food, and the mysteries of nature, their researches to discover the wished-for process of tanning leather, have been as ineffectual as those of the most unscientific tanner.

That the leather manufacture is indeed of national importance, witness the statement of Mr. Smull, an extensive manufacturer of this city, who at a late meeting of the Polytechnic Association, asserted that more hides were tanned in New York alone than in the cities of Paris and London combined. A description of the process employed in preparing the fancy and fine kinds of French and Russia leather may throw some light upon the subject under consideration.

The best kinds of kid leather are made from goat skins, on account of their lightness and smoothness, but cow hides and sheep skins are also used for the purpose. The first operation in preparing the leather is to put the skins into running water, where they are kept for one week, being taken out daily and thoroughly beaten with a wooden brake, a work of skill and patience, which effects the breaking up of the nerve and softens the fiber to a pulpy condition. Next they spend a month in a lye made of lime or ashes, of which the exact quality must be left to the judgment and experience of the operator. The hair is now removed and the alkaline properties are got rid of by soaking the skins in an infusion of white gentian in fresh water for twenty-four hours. The swelling of the skins is a matter of particular care, for which they are soaked four or five days in a mixture of oatmeal and water. They are now ready for the tannin, which is extracted from the bark of the willow. In the first solution the skins remain but three days, and are again beaten with the brake. The second solution, which is stronger than the first, retains them eight or ten days. After being taken out they are dried with the flesh side upward, again beaten, then greased, dried, and finished, using logwood and alum, and alum and green vitriol for the dark coloring. The mode of dyeing is peculiar. A number of skins are sewed up in the form of a sack, closed all around except a small opening at one end to admit the dyeing liquid. When the dye has reached all parts they are hung up to drain, then to dry, and again dyed with asparge, the whole process being repeated two or three times. Again they are greased on the flesh side and grained with a notched stick passing through the length and breadth of the skins until small furrows are gradually produced. After graining, another greasing is necessary, this time with birch or linseed oil, and they are put on the wooden horse to be smoothed. The birch oil gives the leather a peculiar smell which distinguishes it from that prepared by any other process.

There is no article of manufacture in the United States or in the world of more importance than that of leather, and some process for converting raw hides into upper or sole leather in a short number of days or a few weeks would be of the greatest national importance. The present mode of preparing leather necessitates a long and tedious process, which makes serious inroads on the profits of the tanner, and consequently the necessary time is not allowed for properly converting the raw skins into leather, and thus the community have the sad experience that neither sole nor upper leather is impervious to water, and the wearer of the shoe made from it suffers from damp feet, and finally goes into a decline, a practical view of the case that alone should be sufficient to arouse the inventive talent of the American people for the discovery of a quick, trustworthy tanning process, which would speedily bring a fortune to the inventor.

The French tanners use valonia and oak bark with either caustic soda, carbonate of soda, ammonia, or carbonate of ammonia. By the use of these substances a considerable saving in time in the preparation of the skins is effected, and the leather is said to be of superior quality. The tanning is facilitated by means of a roller to which a slow motion is given by steam. The moving of the hides in the bath, the usual process of liming, fleshing, and unliming is carried out, and the skins are then submitted to the action of a bath composed of a solution of extract of valonia or other tanning material. Carbonate of soda is to be added in such quantity that the bath shall be raised 1° on Raumer's hydrometer, the bath then marking 2° on the hydrometer. After three days the skins are removed to a second bath, composed of a solution of valonia of 3°, strengthened one degree as before by adding caustic soda or carbonate of soda. After lying in this bath for four days, being turned several times a day, the skins are transferred to a third solution of valonia, marking originally 7°, but by the means as above, increased one degree in strength. In this liquor the skins are immersed for seven days, when the coarsest kinds must be changed to still another bath, marking, with the added carbonate of soda, 10°, wherein they are to remain for nine days, being turned three or four times during that period.

In the case of ordinary hides they will not need to be subjected to the action of the bath in which thick hides are treated, but they should be transferred from their own bath and allowed to remain seven days, to the final bath, which is composed of the extract of valonia marking 9° on the hydrometer, the bath marking about 10°. Between each hide or skin as they are placed in the bath, about six pounds of oak bark and six pounds of valonia are strewn, and they are allowed to remain therein for fifteen days, when they are removed and finished in the usual way. Finally the process is hastened and the labor of handling the hides lessened by fixing over the bath a roller or winch to which a slow motion is given by a steam engine. The hides are fastened together end to end, and then motion is given to the roller by means of the steam engine, so as to move the hides at the rate of four or five a minute. When the process of moving the hides and agitating the liquor is employed, a stronger bath may be used, beginning at the first bath at 2° of the hydrometer, the hides being regularly moved in the daytime and remaining in the solution two or three days. They are then to be taken out and put into the bath No. 3, marking 7° of Raumer and 1½° of the alkane mixture and to remain in the bath from four to five days, being moved around as before, after which they are placed in the finishing bath with oak bark or valonia scattered between. An example has been made of the properties of the carbonate of soda to be employed in the different baths, but when the other alkalies or other alkaline carbonates are to be used, such as ammonia or carbonate of ammonia, they are used in the same proportions as carbonate of soda, but not marking the degrees given for carbonate of soda, as the density of the solution will vary with the different alkalies. The skill of the mechanic has done more to expedite the preparation of the leather than chemistry, but the great difficulty is, that in quickening the process the quality of the leather is not so good, so that when the best kind of leather is required the old slow method must be adopted.

Catechu will produce four or five times the quantity of leather that oak bark will. A considerable quantity of this tannin is used, but the quality of the leather from catechu is not equal to oak bark tanned leather. The process is much quicker and the tanner is able to save time by the use of catechu; nevertheless the action of this substance on the leather is not satisfactory, as the leather is soft and spongy and absorbs moisture.

Valonia is the fruit of a tree which is known by the name of "acorn cups;" it comes from Italy, Turkey, and the East Indies. The leather tanned with valonia is not liable to absord moisture, and for this reason is preferred by many to oak bark, and presents the advantage of imparting to the leather a smooth, soft, and nice texture, which is thorougly impervious to water. Two pounds of this tannin will make one pound of leather.

Catechu is taken from a tree, acacia catechu, which grows mostly on the Malabar coast. The sap or bark of this tree is boiled, the solution evaporated, and the astringent matter is taken by this process. There is another kind of catechu brought from the East which is known by the name of gambir. This is collected on the shore of the Malacca; the wood, bark, and leaves are boiled in water, and when evaporated there is added sago to give it a body; it is then dried in the sun ready for use. Five thousand tuns of this catechu, better known as gambir, are annually exported from Rhio by the Chinese. It yields forty per cent of tanning matter. This substance of catechu, or kassu, as the natives call it, has been introduced into Europe, but has not as tannin yielded satisfactory results. Sumac is used for the preparation of Spanish leather. It is said to harden the leather. It is quite expensive, its cost varying from $100 to $150 per tun, and is chiefly used by the glazed leather manufacturers. Devi-divi is also used in tanning operations, but has the bad reputation that leather tanned by it is porous and consequently absorbs moisture.

Birch bark is used in Ireland for tanning bazils. It contains 7 per cent tanning matter. It is also used in France for making the fine red leather and other fine kinds known as Russian leather.

Hemlock is principally employed in tanning in this countsy, and such leather is porous and absorbs moisture. It is likewise stiff and hard, and presses on the feet.

Elm bark is very generally used in Norway for making leather, and it is said the fine Norway gloves are prepared from the elm bark, and that the softness and beauty of the leather are attributable to this bark. The white willow is used in Denmark for the manufacture of gloves. Russia also uses this bark in the manufacture of fancy leather, and the leather being impregnated with the oil of birch bark, which gives it a peculiar, agreeable smell. It is a noteworthy fact that the Norway tanners use birch and willow in preference to oak bark.

France uses the bark of a species of oak known as komes oak, a stunted shrub growing in the south of France. This species of oak is in clumps, and grows in hight to about three feet. The shrub which is called coppice oak has roots of a yellow brown hue, and is very rich in the tanning principle, and is used in France for tanning sole leather of first quality.

Vaugrelin, by chemical analyses, found that kino contains 75 per cent of tanning property. Esanleck found that terre-japonica or gambir contains 40 per cent. White willow, according to Davy, contains 16 per cent; birch bark, 1·6 per cent; beech bark, 2 per cent; weeping willow, 16 per cent; sumac, 16 per cent; and sassafras root, 58 per cent of tanning matter.

For the removal of the hair and other extraneous matter from the skin, some of the French tanners use acids; others employ a bath of sour milk for the purpose. The acid ferment of milk and barley meal is acetic acid, and is found to be very efficacious for the separation of the hair and other substances from the skin. Sulphuric acid is a good agent, but from its causticity is very likely to injure the leather if not used with great care. The process of sweating, which is adopted in the United States, is known to all experts in the trade, and it is needless to expatiate on it.

The process of oak tanning is of such general use and so familiar to the trade that it is of no interest, or there is no novelty in the process that is not familiar to all tanners.

The vapor of steam has been introduced for removing the hair, a method that finds great favor in France. The hides are hung up in a close room the floors of which are perforated with holes, through which steam is admitted. By this process the hair becomes soft and is easily scraped off with the hair knife, and a quick process is afforded, and one having the advantage that the hides cannot be injured by putrefaction, as with the ordinary tanning processes.

THE WATCH---ITS HISTORY AND MANUFACTURE.

By H. F. Piaget.

Toward the middle of the sixteenth century springs were applied instead of weights as the maintaining power to time-pieces, thus enabling them to be made small and portable; but these pieces, now called watches, were imperfect machines, going with even less precision than an an old clock; they had only an hour hand, and most of them required winding twice a day. Scarcely more than a century has elapsed since watches were nearly completed, with the exception of the external parts, by individual labor alone.

The art of watch making is now divided into more than thirty or forty different branches, according to the different kind of watch made. By machinery and a division of labor, watches are now made at a much lower price than formerly; but for their greater perfection we are indebted to improved principles. The English were the first successful manufacturers of watches; all the escapements applied to good ones, whether at home or abroad, were invented by them. It is true that many ingenious contrivances have been introduced at different times by French and Swiss artists, but they themselves have ceased to apply them: and with the exception of the vertical (the inventor of which is unknown), they generally adopt those principles only which were first devised by English watchmakers. The horizontal, or cylinder escapement, by Graham, the lever escapement, by Mudge, the duplex, invented by Dr. Hook and perfected by Dyrer, while the detached or chronometer escapement, although invented by Berthoud, is indebted for its accuracy to the improvements by Arnold, Earnshaw, and Dent.

The discovery of the art of piercing holes in rubies for pivot holes to watches, is attributed to M. Fazio, a native of Geneva, who having failed in his attempt to get his plan adopted in Paris, went to London in 1700, where the art of watch-making was rapidly advancing. He was well received, and his plan being very generally adopted, added greatly to the reputation of English watches. The rubies are still used in good watches; they are the hardest stone that can be drilled, but at the present time cheap watches are jewelled with all kinds of stones, as crystals garnets, etc., they being cheaper: English and American watches have however usually the jewel over the upper part of the balance made of diamond, it does not require to have a hole through it, the pivot resting on the end instead of a shoulder, as in the wheels, on account of the extreme freedom required. The English being a maritime nation, their attention was early directed to the improvement of marine chronometers, and their researches enabled them to give an accuracy to pocket watches, which rendered them preferable to all others. The French have never been able

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to establish a large or permanent manufacture of watches, although from the exertion of several eminent men, as Le Roy, Breguet, and Lepine, they have produced them of a very superior class. They were the first to reduce the size of the old watch, and from the high price not unfrequently given, they could afford to bestow much care and time upon the construction, so as to produce astonishing precision in the small watches. The Swiss have become the largest manufacturers of watches in the world; this arises partly from the absence of other branches of industry, but principally from the low price of labor; also from the number of females and children who work at the business, (the writer commenced when only seven years old,) enabling them to produce at so low a rate as to have entirely superceeded the French watch. The cheap and showy watches which inundate the windows of jewelers, dealers in trinkets, etc., in every country, as well as those advertised as so cheap, are principally of Swiss manufacture; but if English, they are generally of an inferior quality.

In the reign of William III., of England, it was considered necessary to pass an act obliging watch makers to put their names upon all their watches, to prevent the discredit to which the manufacture was exposed from the bad watches sold abroad as English.

Different governments have endeavored to enforce protecting duties. Twenty years ago, all foreign watches imported into France for the purpose of sale, had to be stamped, to show that they were not of French make, and that the duty had been paid; this stamp (a bull's head) could be seen on nearly all the watches sold in Paris at that time. It was generally put upon the pendant, but occasionally on the other parts of the case. In England there was a duty of twenty-five per cent on the importation of foreign watches for sale. Those for private use were admitted on a fine of five shillings each, and a recent law enacts that they shall have the maker's name and place of abode engraved upon the movements.

There is, however, no stamp, as there is in France, and smuggling is carried on to such an extent as to render the duty ineffective as a protection to trade, and of little value to the revenue; while in many instances where the duty has been paid, fresh names are engraved upon them, and they are sold as having been made in England. For the protection of the American manufacture of watches, some plan should be adopted to be enabled to distingnish the genuine from the false, for the American watch is at the present time imitated abroad, and many persons may yet be deceived when they think they are encouraging home manufacture, are wearing watches (the case perhaps excepted,) of foreign make.

Watches and movements are imported in this country, particularly the cheap kinds, which have the names of some celebrated maker engraved on; others, with the name of makers long extinct, or of some which never existed. This can only be prevented by applying to an honest and upright watchmaker or dealer, who will not deceive you, if he values his reputation.

More rapid production and better workmanship in the detached pieces or parts, are the natural results of a well matured system of division of labor; but sub-division for cheapness alone, is destructive to the unity necessary to produce a good watch; hence, while lowness of price is a point of competition (and to meet the demands of society it always will be), the greater number of watches must be of an inferior kind.

The great difficulty of establishing this manufacture, even under the most favorable circumstances, has been amply shown by the failures of those in France; while those in Germany have been equally unsuccessful.

There are manufactories of watches in this country which make a very good time-keeper, and are continually improving; but a great help to them would be a heavier duty on foreign watches and movements. This I hope will be done, and that the American watch will be successful.

The English and Swiss are now the sole exporters of watches, and they may be said to supply the world. Swiss watches are handsome—their size also in perfect accordance with the present taste—and did the production of the two countries differ in price only, this manufacture would be lost to England as it has been to France.

No one doubts that it requires a certain skill to make or mend a watch, yet many doubt that it requires certain knowledge to choose one, and, when chosen, certain care to use it.

Care will go a long way, but not all the way; to care must be added some knowledge to give the right direction to its exercise.

My lengthened experience has taught me that numbers of valuable watches are often ruined by the want of care or skill in their use, and then the blame is laid at the door of the watchmaker.

A man buys an expensive watch, and naturally expects it to perform well; he misuses it, and it either stops altogether or performs badly; he exclaims, "I have been duped in buying that watch." He takes it to a third party to set it to rights; that done, he again misuses it, or some unavoidable disarrangement happens to it; he then declaims against all watches and watchmakers.

Thus a watch, which should be an article of use and ornament to its owner, is too often only a source of vexation and expense.

Now I propose partly to remedy this, not by attempting to make every one his own watchmaker, but by imparting, in a familiar manner, such practical hints of the construction and the use of a watch as will enable them to use it properly, and guard against some of the annoyances and expenses which, without such information, they are liable to incur, as well as prevent the watchmaker or repairer being frequently erroneously blamed.

The inexperienced in the trade will also find many suggestions which may be useful to them, for they must know that a good watchmaker is not always a good repairer; for, owing to the variety of different kinds of watches that pass through his hands, practice must be added to knowledge and skill, to properly repair a watch.

MORSE'S PLAN FOR CENTERING AND PACKING BOBBINS.

When wooden bobbins are used in spinning woolen or cotton yarn for weaving, there is some difficulty in properly centering the bobbin on the spinning spindle; the caliber of the bobbin becoming worn, it will not adhere sufficiently to the spindle. The temporary expedient of putting between the spindle and the interior of the bobbin a bit of waste or roving is a poor plan, troublesome and wasteful. Any packing intended to be permanent should be able to resist the action of the steam which is used for taking the kinks out of the yarn. The object of the simple device seen in the engraving is to prepare the bobbin for the reception of a packing that shall be effectual and shall center the bobbin on the spindle as perfectly after it has been steamed as before.

As will be seen, Fig. 1 is a miniature lathe or drilling

Fig. 1

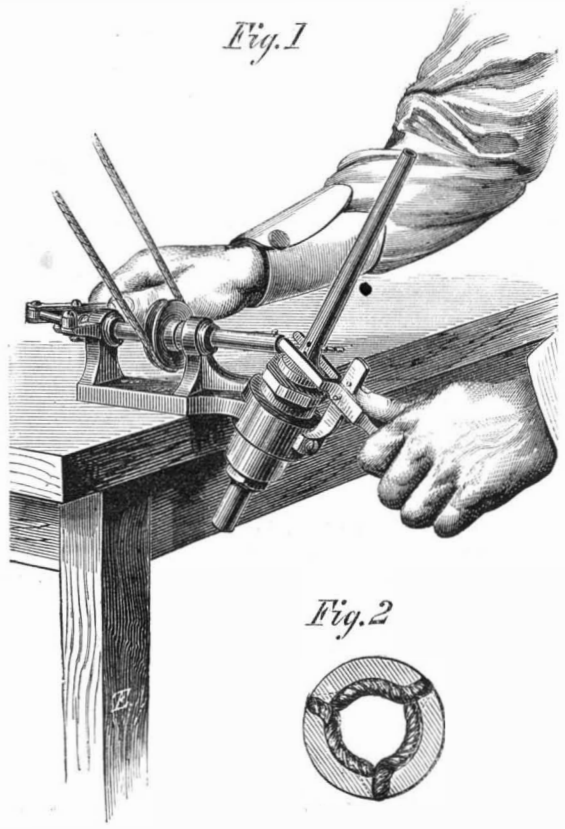


Fig. 2

machine attached to a bench or table. It is driven very rapidly, carrying in its spindle a twist drill. The spindle is advanced to the work, or drawn back, by a lever as in many other drilling machines. The bobbin to be drilled is placed on a stud corresponding to a portion of the spinning spindle, which stud is held in a hollow cylinder passing through a bearing bored eccentric to its support, which stands at an angle to the horizontal boring shaft. The bobbin to be drilled is held firmly to place by a forked lever bearing on its base, and is further retained in position by three sharpened pins inserted in the base of the cylinder on which the bobbin rests. The support of the bobbin, being eccentric to the bearing, the bobbin presents its side to the drill. A ratchet and pawl inside the bearing allow the bobbin support to be turned one third of a revolution and hold the bobbin securely in position while being drilled. The holes thus drilled pass diagonally across the bobbin near the base, cutting into the caliber of the bobbin. Through these holes is passed a bit of twine or rubber, the wood between the holes on the outside being grooved out so that the packing will not project beyond the outer surface of the bobbin. Fig. 2 is a transverse section showing the intersection of the holes and the packing in place. When the packing is in the holes the substance of it, as seen in Fig. 2 will project equally into the bore of the bobbin so that when the bobbin is placed upon a spindle the parts thus projecting will bear upon its sides uniformly and secure the bobbin firmly in a central position. The holes may be bored in any part of the bobbin and at any angle desired, as the parts of the machine are adjustable.

Patented through the Scientific American Patent Agency Feb. 11, 1868, by C. B. Morse. Patents abroad have also been solicited through this office. For further information address "Union Iron Works," manufacturers of and dealers in all kinds of cotton and woolen machinery, Rhinebeck, N. Y.

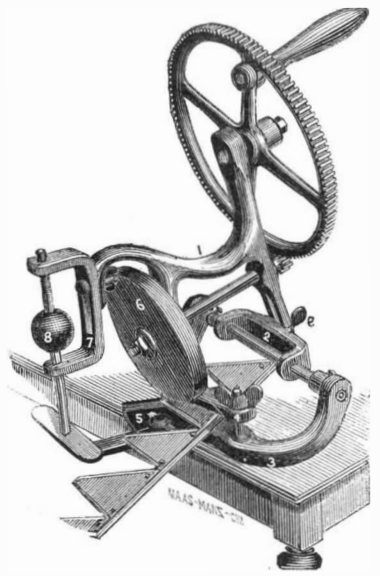
Embalming.

The efforts which have recently been made to discover an efficient, quick, and inexpensive process of embalming dead bodies, seem crowned with complete success. A subject treated by the process of Professor Seely was examined recently by Professor Wood and a company of distinguished gentlemen, at the Bellevue Hospital, and although it had been kept one hundred and three days, it was found in perfect preservation. It was without smell, and the face presented a naturalness that was startling. It is claimed for this process that it arrests decay at once, and the examination of the body substantiated the fact. No injection is made in the veins, nor cut or incision in the body. A simple wash, applied externally, effects the change. It is claimed that the bodies embalmed will last a century. The learned professor of the hospital expressed himself astonished at the result, and, in response to a question of Mr. Clark, the agent for the patentees, replied, "I never saw anything like it in my life." The process has been patented, and the agent for the sale of rights is W. B. C. Clark, 713 Broadway.—*Home Journal.*

[The combination of materials used, and the mode of application in embaling is fully described in the Scientific American of April 11th. The discovery is one of vast importance and the patent of Professors Seely and Eames promises to be of great pecuniary value to the inventors.—Eds.

THE EXCELSIOR GRINDER FOR MOWING AND REAPING MACHINES.

A handy implement for grinding the teeth of reaping and mowing machines, now so generally used throughout the the country, is certainly a desideratum. It is a work requiring skill and care to grind these triangular knives on an ordinary grindstone, where the bevel of the teeth must be assured wholly by the nerve of the workman. Such a machine is seen in the accompanying engraving, where the grinding or emery wheel is shown by Fig. 6, the frame of the machine by 1, the shaft upon which the driving wheel and grinder is



pivoted by 2, and the adjusting screws for giving any angle required to the grinder by 8 and 9. Fig. 5 shows a screw for adjusting the bed plate, holding the tooth plate at the angle desired, and 4 is a screw clamp for securing the plate to the bed. This device can be taken into the field and operated by hand, grinding the teeth more perfectly and rapidly than by any other method. When cutters are ground by the old process the point of the tooth is soon ground off, and the grass clogs between the point of the tooth and the finger bar. With this machine, the angle can be so adjusted as to preserve the length of the tooth, overcoming this difficulty, and the cutter will outwear two ground by the old process. It is cheap in price and simple in construction, and always grinds the teeth to a uniform angle. It is made wholly of iron, in a substantial manner, and weighs, complete, only about sixteen pounds. Its advantages are apparent to any one using mowing machines, without further description.

It was patented Feb. 18, 1868. All communications should be addressed to Mellen & Doane, No. 32 Reynolds Block, Chicago, Ill. State and manufacturing rights are for sale.

Science in a Toy.

A very amusing application of frictional electricity has been recently patented by Messrs. Funston and Blockstone, 912 Market street, Philadelphia, Pa., in the shape of a small ornamental, shallow box, having for its bottom a plate of looking-glass. Another sheet of common glass forms the cover, and there is a space of perhaps an inch and a half between the two glasses. A variety of figures cut out of paper, or other light substance, are laid upon the looking glass, and on gently rubbing the surface of the upper glass with a handkerchief or a piece of paper, the several figures become electrified, assume the erect position, and dance about at a great rate, much to the amusement of lookers on. When not in use the box may be hung up to serve as a mirror. The makers furnish a great variety of forms of these toys, and the prices run from fifty cents upward.

New Galvanic Pile.—A new galvanic pile has been constructed with chloride of silver, for the negative element, by MM. Warren de la Rue and Hugo Muller. This pile, though of exceedingly small dimensions, is extremely powerful. It consists of a zinc rod, which need not be amalgamated, and of a thin silver wire coated with a certain quantity of chloride of silver applied to it in a state of fusion. This is the negative, the zinc the positive element; the whole apparatus is not three inches high. The liquid used is a saturated solution of common salt. With ten couples, constructed as above, acidulated water will be rapidly decomposed. While the apparatus is working, the solution of salt becomes gradually charged with chloride of zinc, which only serves to increase the power of the pile; but care must be taken to change the solution as soon as metallic zinc makes its appearance on the negative element.

Strength is power only when exerted in some way which utilizes the strength. Exerted to no useful purpose it is worse than wasted.

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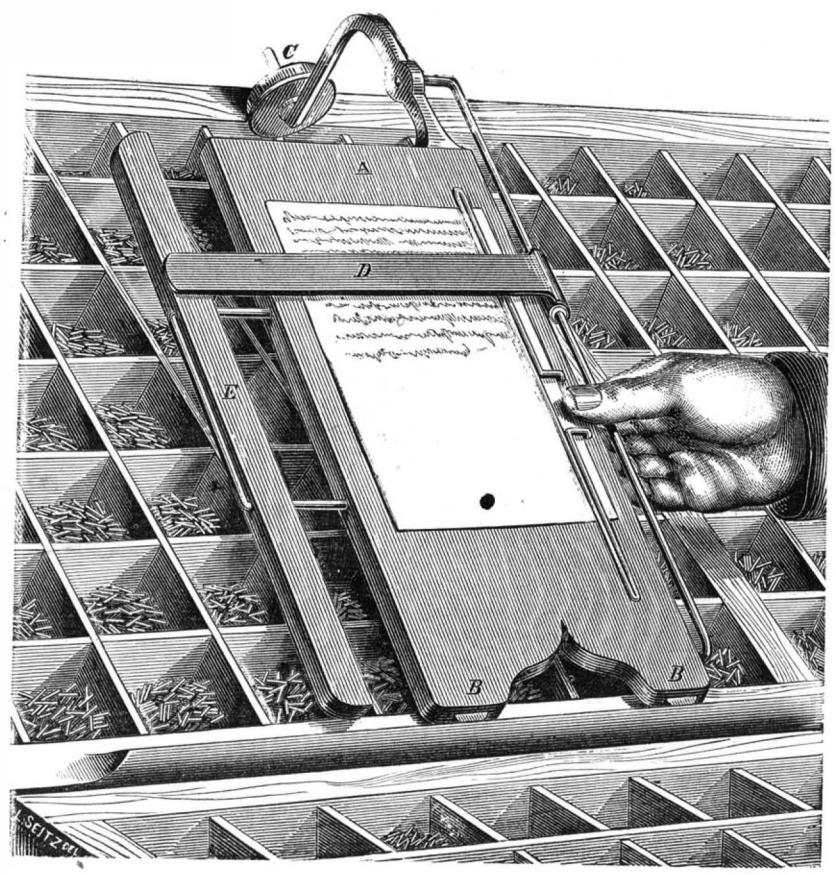
Improved Copy Holder for Compositors.

It is not unfrequently the case that copy, intended for printers' use, is required to be kept clean and returned to the writer in good condition. Manuscript laid on the printer's case will, however, become soiled unless great care is used by the compositor. If a window is left open the manuscript is liable to be disturbed, and other annoyances attend the present *loose* way of using copy. The object of the device shown in the engraving is to prevent all these annoyances, a result we know from actual trial in our composing room, it will do.

The copy holder consists of a platform, A, made of thin board, bound with sheet brass on its edges, if desired, having rollers on its lower edge, as at B, and a gooseneck sustaining a roller, C, at the upper edge, intended to facilitate the movement of the device from one side of the case to the other, their position and action being plainly shown in the engraving. The guide, D, is a blade passing across the copy board hinged on a rod extending down the side of the device and held in place by a gland of rubber or leather on the rod. The copy is held on the platform by a bent or double wire, or other device, actuated by a coiled spring under the platform—not shown in the engraving—the position of the hand alone showing its action. This wire holds the copy, and by the spring it may be moved as the occasion may demand. The bar, E, is an extension of the device intended to accommodate wide copy. It is guided, as seen in the engraving by a square staple of wire entering the substance of the platform.



LA FRANCE'S PATENT COPY HOLDER AND GUIDE.

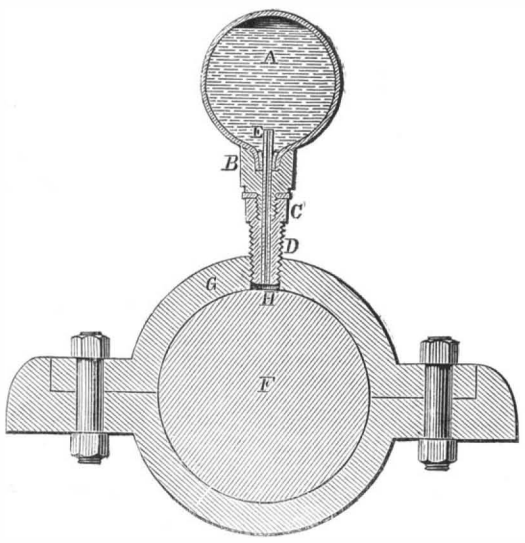
The patentee enumerates the advantages of this device as follows: The facility with which it may be moved from one side to the other, leaving uncovered any portion of the case from which type may be wanted; avoiding the soiling of the manuscript by frequent handling and contact with the type; giving a better view of the manuscript by its being raised nearer to a perpendicular position by means of the gooseneck support at the upper end; and the effectual holding of the copy, keeping it perfectly flat and preventing its movement by currents of air.

Patented Nov. 12, 1867. Orders for the holder and all communications relating to it should be addressed to the patentee, Mr. P. A. La France at Elmira, N. Y. By a slight modification of the device the inventor adapts it for copying manuscript, etc., and has received orders from a great number of concerns doing such work, and from the different governmental departments at Washington. Our experience with the device has been very satisfactory.

HILBERT'S SELF-ACTING LUBRICATOR.

This lubricator, secured by letters patent to Benjamin Hilbert, of Cincinnati, Ohio, is thus described, reference being made to the accompanying engraving, representing a vertical section:—

A is a transparent reservoir for oil upon the neck of which



is cast a metal socket, B. C is a nipple screw, firmly adherent to B, and making a joint with the upper nut-shaped end of D, which is a brass screw, for attachment to the cap over a journal. E is a brass tube passing through B, C, and, D, and fitting snugly in D, its upper end rising a quarter of an inch, more or less, above the neck of the reservoir into the oil, its lower end being adjusted to not less than 1-16, nor more than ⅛ of an inch above the journal. The application of the lubricator to a bearing is shown in the cut, where, F, is the journal, G the cap, and H the space between the end of the inner tube, E, and the journal.

The screw, D, is designed to be permanently attached to the cap, G, the reservoir being removed for filling by unscrewing C. From the shape of the reservoir, A, and the small diameter of the passage through the tube, E, it results that no oil will escape from the lubricator while the journal, F, is at rest; but the journal being in motion, the agitation of the air in the space, H, together with the ordinary suction created by such motion, causes the oil to flow slowly or rapidly as the agitation and suction are greater or less; *ergo*, according to the velocity of the journal.

The peculiar advantages of this lubricator over all other contrivances for the same purpose are claimed to be as follows: Its greater simplicity. Its non-liability to be gummed and choked up by any impurities in the oil or on the journal. The upper end of the tube, E, rising into the reservoir, allows any impurities in the oil to settle around it and not in it, while the lower end, standing entirely free of the journal, will not catch or take up any gum, or impurities moving thereon. Its being completely automatic in its operation, having no shaking wires, felting, wicking, regulating screws, or other parts liable to become inoperative through inattention. Once firmly attached to a bearing, it requires no attention beyond being filled when empty, the necessity for which can be readily seen through the transparent reservoir. Its economy of oil. Its applicability to bearings in cold rooms, where, in winter, the oil congeals. The least warmth in the bearing is communicated to the tube, E, which transmits it to the oil, rendering it liquid.

The general agents for the sale of this Lubricator in the Eastern States are R. M. Graham & Co., No. 81 Nassau st., after May 1st, 55 Liberty st, New York city.

Spontaneous Generations.

In a late French publication to which we have already referred, M. Pouchet brings forward among others the following facts in favor of the hypothesis of spontaneous generation. There exists, says the author, vegetables which show themselves only in circumstances so exceptional that it is impossible for us to imagine their seeds encumbering the atmosphere during centuries, in order to fertilize, at only rare intervals, some point of the globe. A fungus is known which develops only on the corpses of spiders, another which grows only on the hoofs of horses in a state of decomposition. The *isaria* has as yet been observed only on certain night butterflies; there are other species which invade the larvæ and chrysalides. Hooker has discovered a fungus which attains considerable dimensions (from 10 to 12 centimeters), but which is found absolutely only on the neck of a certain caterpillar in tropical countries. It vegetates on the animal, fructifies on it, and the caterpillar buries it with itself in the ground, whence it springs like a funeral plume. "Must it be then," says M. Pouchet, "that the air has been crammed with seeds in order that one should fall from time to time on a dead spider or on the neck of a caterpillar?" As a particular vegetable invades each species of fermentation, it would be equally necessary that the germs of all these microphytes should have floated in the atmosphere from the creation until the day a new fermented liquor was invented. Still more, a singular vegetable is known, the *racodium cellare*, which has never been found except on the casks in wine cellars, and another which lives only on the drops of soot which the workmen let fall on the soil of mines. "Have the seeds of these vegetables remained without use from the origin of the world to the day that they found their proper soil?"

A POWERFUL PRINTING PRESS.—M. Marinoni has put up in the new printing office of a popular daily paper of Paris, called the *Petit Journal*, a marvellous machine of his own invention which prints 600 copies a minute. Four of these powerful presses turn out 144,000 copies an hour, the whole impression of 446,000 papers daily, being worked off, it is said, in a little more than three hours.

Correspondence.

The Editors are not responsible for the opinions expressed by their correspondents.

Process for Casting Steel under High Pressure.

MESSRS. EDITORS:—I saw in a recent number of the *Public Ledger*, Philadelphia, a general notice that steel castings are made sound and free from air bubbles by being compressed by gaseous pressure—that it is quite successful in France. In order that your readers may have a correct idea of the procoss I annex an extract from Antoine Galy-Cayalat's U. S. patent, Feb. 19, 1867:

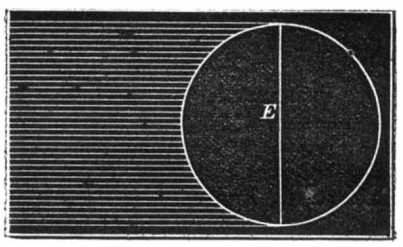
"It is well known that cast steel run into molds is subject to blister, and is otherwise porous, which defect reduces considerably its toughness. In order to give this metal its requisite tenacity, it is subsequently reheated and then rolled and hammered, As many articles, such as cannon, cannot be treated in this manner, I have devised to submit them to a high pressure while in a liquid state inclosed in their sand molds maintained in iron flasks. For this purpose, immediately after running a cannon, I cover hermetically the head by a metallic cap, by means of bolts or other devices attached to the flask. This cap is fitted in its center with a vertical pipe, and provided with a cock at its lower extremity, while its upper extremity is closed by a washer pressed with a bolt in such a manner as to act as a safety valve. Before attaching the cap at, supposing an inch from the surface of the liquid metal, I introduce in the vertical pipe, and between the cock and the washer a charge of about one quarter of an ounce of gunpowder, in the proportion of eighty parts of saltpeter and twenty of charcoal, with no sulphur. On opening the cock this powder falls on the metal, ignites, and engenders about one third of a cubic foot of gas at 1,400° Cent. These gases exert on the liquid metal a pressure which is transmitted through the entire mass, thereby condensing the same and expelling the blisters. The effect thus produced is equivalent to the pressure of a head of liquid metal ninety feet high, admitting that the capacity between the cap and the surface of the metal contains thirty cubic inches. By making the flasks sufficiently strong the charges of powder may be varied, so as to produce by its ignition a uniform and general pressure, which is preferable to the partial, irregular and momentary action of a hammer."

JAMES HENDERSON.

New York City.

Do We See the Sun so soon as it Rises?

MESSRS. EDITORS:—It is laid down in books that, as it takes light eight minutes to come from the sun to the earth, we do not see the sun until eight minutes after it has risen. Now, I hold that the sun, being stationary, and pouring a steady stream of light against the earth, we shall be able to see the sun the instant we are carried by the rotary motion of the earth up to the point where the sun's rays can strike us. It is intended to leave out of the problem refraction and other disturbing elements.



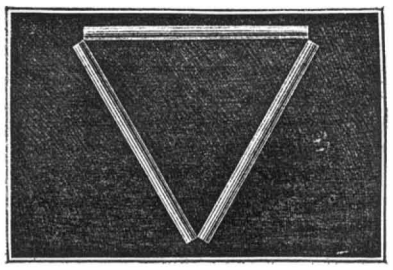
In the diagram, E represents the earth, and the parallel lines the sun's rays. Owing to the immense distance of the sun these rays are as nearly parallel as could be represented in an engraving.

Perhaps it may amuse some of your readers to try the solution of this problem. G. B.

[The above was probably the last contribution of our esteemed and lamented co-laborer, George Bartlett, whose sudden and untimely death we noticed in our last issue. He wrote it only two days before his death, and it is evident from its construction and its brevity that he intended it for an introduction to other articles on optics, a subject he understood, probably, as well, if not better, than many scientists whose names are more widely known.—EDS.

Optical Illusions.

MESSRS. EDITORS:—On page 211, current volume of the SCIENTIFIC AMERICAN, a correspondent asks, under "Curious Optical Effect," "Will some one, etc., please give us an explanation of this deception?" I would say, that if J. Herva has always exhibited the two bars as in his diagrams I do not wonder at his friends' conclusions, because the upright is really longer than the horizontal bar by the thickness of the latter. This will make some difference at least! Therefore I think that J. H. would reach the bottom of the illusory experiment more effectively were he to try it by the triangular process. Both he and his friends could turn all angles round to the eye, and see if the same illusory results followed. J. HEPBURN, SEN.



Gloucester, N. J.

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Improved Compound of Aniline Colors.

Emil Zinssmann, of New York city, has lately patented the following:

"This invention consists in a compound, which is soluble in water, and made of aniline colors, which, in themselves, are not soluble in water, by treating said colors with glue or gelatinous materials, or with different kinds of gums, such as gum arabic or gum tragacanth, or with starch, which is soluble in water, or with other equivalent materials, either alone or mixed together, in combination with either acetic acid, or glycerin, or saccharine solutions or decoctions of plants, or any other liquid which will produce the desired effect; said materials being combined mechanically to a thick sirup-like homogeneous mass, and then mixed together with the aniline color (which is to be rendered soluble in water), and heated in such a manner that a product is obtained which retains all the coloring properties and qualities inherent to the aniline colors, and which is so perfectly soluble in water that it can be used with the best success for dyeing and printing all fibrous materials, and consequently the expensive operation of dissolving the aniline colors in alcohol, which, with aniline colors as now made, is indispensable, particularly for dyeing and printing wool or cotton, or fabrics made therefrom, can be dispensed with.

"In carrying out my invention, I proceed, for instance, as follows: I take a quantity of glue (about from two to six pounds of glue to one pound of the color), and dissolve the same in common acetic acid of seven or eight degrees, so as to form a thick, sirup-like mass. With this thick solution I mix the aniline color previously reduced to a fine powder, and then I work the mass until it forms a fine thick homogeneous pulp, either by means of suitable stones, or by passing the mass through a mill, or in any suitable manner. The pulp thus obtained is then placed into a suitable vessel (best an enamelled kettle), and heated in a water bath under constant agitation or kneading, it being desirable at the same time to provide the vessel containing the pulp with a tightly-closing cover, so as to prevent the undue evaporation of the liquid parts of the mass. It must be remarked, however, that the desired reaction, or, in other words, the perfect dissolution of the aniline color in the glue, or the equivalent material, will take place only and best when the pulp in the water bath forms a mass of such thickness and consistency that it just can be kneaded or stirred. If the pulp should, however, become so thick that it cannot be stirred or kneaded before the aniline color is perfectly dissolved in the glue or equivalent material, the addition of a small quantity of the corresponding liquid is sufficient to reduce the pulp to the desired consistency. From time to time a small quantity of the pulp is taken out, dissolved in hot water, and while hot passed through a filter, and if no color remains on the filter, the process can be considered completed, and the product can be used immediately, or it can be dried and preserved for future use.

"For purple aniline colors, with the exception of the bluish purple, such as "Parme," or of the aniline blue, about two or three pounds of glue or gelatine to one pound of the color are sufficient, but for bluish aniline, such as "Parme," or for aniline blue, it is better to use from four to six pounds of glue or gelatine. For blue aniline, or for "Parme," the use of glue and acetic acid is to be recommended, but for purple aniline I can use gums, or starch which is soluble in water (dextrine), and the acetic acid can be replaced by glycerin or decoctions of plants, such as soapwort (*Radix saponica*), or materials of a similar effect, and this change is to be recommended, because the acetic acid affects and injures the hue of the purple aniline colors. If glycerin and glue are employed, it is necessary to soften the glue first in a small quantity of water, and then to effect the combination of the glycerin and glue by heating them together.

"By this treatment I am enabled to produce from aniline colors, which in themselves are not soluble in water, a compound which is perfectly soluble in hot water, thus forming a solution which is applicable with great advantage in place of the expensive and unreliable alcoholic solution of said colors. The great saving effected thereby is apparent from the fact that at present, for the purpose of dissolving one pound of purple or blue aniline colors (particularly for the purpose of dyeing or printing woolen and cotton materials), from twenty to thirty pounds of the strongest alcohol, or a still larger quantiy of methylene or wood spirit, are required, and even then the solution thus produced is not reliable or perfect. If the alcoholic solution remains standing a short time, a portion of the color is precipitated from the same, and if said solution is used for dyeing, the color of the dyed fabric is many times not uniform, and liable to come off. By the use of my compound all these disadvantages are avoided, it dissolves perfectly; the coloring matter is not liable to precipitate from the solution, however long said solution may remain standing, and wool, silk, cotton, also paper, and different other materials or fabrics can be dyed or printed therewith with the greatest ease and perfection.

"I am well aware that products soluble in water have been prepared by treating aniline colors with sulphuric acid, but such products are applicable more particularly for dyeing and printing leather or silk, but little or not at all for dyeing and printing of wool or cotton or fabrics made therefrom. I am also aware that some time ago, glycerin or decoctions of plants have been recommended for the purpose of dissolving aniline colors. But the extensive and common use of alcohol as a solvent of these colors, shows that said materials did not produce the desired result. I have never succeeded in producing, with these last-named materials alone, anything like a satisfactory result, and it is only possible to effect the solution, if at the same time a substance is used, such as glue, or equivalent material, as above specified.

"Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is: A compound, which is soluble in water, and made from such aniline colors which in themselves are not soluble in water, by treating said colors with glue or equivalent substances, either alone or mixed together, and with a liquid, such as acetic acid, or glycerin, or their equivalents, either alone or mixed together, as herein set forth."

Protection of the Eyes of Metal Workers.

Dr. Hermann Cohn, of Breslau, an oculist of some standing in the medical world, who is particularly well known by his examination of the eyes of 10,000 school children, has recently occupied himself with statistically ascertainlng the effect which the occupation of metal workers has upon their eyes. The results he obtained by examining 1,283 factory workmen of Breslau, are of the utmost interest for both masters and men in this branch of industry, and are worthy of a short abstract from the original paper, published in a medical journal, the *Berliner Klinische Wochenschrift*. Although his range of observation was necessarily very limited, inferences on other similar branches are easily made.

Dr. Cohn examined the workmen of six engineering establishments, whom he thus classifies:—599 fitters, 386 blacksmiths, 129 turners, 35 drillers, 13 planers, 27 enginewrights, 5 screwers, 15 boilermakers, 69 foundrymen, 8 cleaners of castings—altogether, 1,283. He did not include any laborers in his examinations, because their occupation is too shifting, and therefore he confined himself to mechanics with a constant occupation of the same character. About 90 per cent of these men declared that their eyes had often been struck by small chips of iron, turnings, borings, or filings, which had been removed by some of their fellow-workmen. In every workshop there is a man or two who have acquired by long practice a remarkable proficiency in removing foreign bodies from the cornea. All those minor accidents were excluded by Dr. Cohn, and the following figures refer only to such accidents of the eyes as required medical aid, and caused for the most part an interruption of work. Of the 1,283 workmen examined there had been 633—that is, 49 per cent—under medical treatment for accidents caused to their eyes by metal chips, etc., and this on an average twice over, the number of accidents to the eyes being 1,231—that is, 96 per cent of 1,283. The cleaners of castings seem to be most exposed to such accidents—87 per cent; then come the enginewrights, 83 per cent; turners, 69 per cent; drillers, 54 per cent; boilermakers, 53 per cent; fitters, 49 per cent; planers, 46 per cent; blacksmiths, 44 per cent; foundrymen, 26 per cent; screwers, 20 per cent. Out of the 633 wounded men, 354 were soon relieved by medical treatment; but 279 required more or less time before their eyes were cured, and they consequently had to stay from work all this time. The whole time lost in this way amounted to 4,726 working days—that is, on an average, 17 days for each wounded man. The eye wounds of drillers, cleaners of castings, and turners, were soonest healed (four to ten days); next come planers, screwers, enginewrights, fitters, and blacksmiths; foundrymen and boilmakers seem to be exposed to the most dangerous eye wounds, requiring from 40 to 47 days for curing. Out of the 1,231 eye wounds, 1,172 were completely cured, 38=3 per cent, were not completely, and 21=2 per cent, not at all cured. This means that of 1,000 metal workers, 28 lose part of their seeing power, and 16 the whole use of one eye in consequence of their occupation.

It would not be much to the purpose in this place to follow Dr. Cohn in the medical detail of the different wounds, and their effect on the eye; only so much may be mentioned that the wounds of blacksmiths and fitters are, as a rule, of a much more dangerous character than those of other men, and that they also lose one of their eyes much oftener. This is no matter of surprise, since their eyes are mostly hurt by red hot metal. Now the question arises, Cannot this danger to the eyes of metal workers be avoided by their using protecting speclacles? Of the men examined by Dr. Cohn, only 21 used blue conservation spectacles, in consequence of previously received wounds; and 31 used ordinary convex glasses, owing to their being far-sighted. Not one used protecting glasses. When asked why they did not take more care of the most noble organ of their body, the men always replied, "Spectacles are too easily broken." "They are too heavy and they are too dear." These objections are unquestionably valid, and caused Dr. Cohn to consider what other preventive means might be resorted to against those two frequent accidents to the eyes of metal workers. There happens to be a manufactory of objects of mica, uch as lamp chimneys, etc., at Breslau, where Dr. Cohn resides, and thus mica suggested itself to him for his purpose. He caused Mr. Raphael, the proprietor of the just mentioned establishment, to try experiments with manufacturing protecting spectacles from mica, and those experiments were crowned with perfect success. They seem to have completely solved the above named difficulties.

The mica spectacle glasses are curved somewhat in the shape of watch glasses; they not only protect the eye in front, but their brass frames fit closely on the osseous circle round the eye sockets, so that no chips can enter the eye from any part, and still the eyelashes do not touch the glasses. The frame is made of thin brass wire, which can easily be bent by hand into any shape. As hinge joints would have caused too much expense, the side parts are soldered on to the frame. The thickness of the mica is about one-twenty-fifth of an inch. Only the purest kind of mica being used for this purpose, these spectacles are just as transparent as real glass ones. They impart, to be sure, a slight pale grey tint to the objects, but they do not in the least weaken the optic nerve of the eye. For blacksmiths and foundrymen such a grey tint is rather an improvement, and for other metal workers it is not in the least objectionable. Now these mica spectacles, besides protecting the whole eye, have the following advantages: First, they cannot be broken; heavy blows with a sledge-hammer only squeeze them flat, without breaking the glasses. They may be thrown to the ground with full force without being damaged in the least. Red hot metal poured on the mica does not make any impression on it. The shower of pointed particles of iron which issues from lathes, etc., only rebounds from the perfectly elastic mica glasses. Secondly, mica spectacles are almost twice as light as glass spectacles; a pair of French watch glass shaped spectacles weighs 13·9 grammes; mica spectacles only 7·5 grammes. Thirdly, mica spectacles keep the eyes of the workmen cool, mica being a very bad conductor of heat. Fourthly, mica spectacles are very much cheaper than glass spectacles, especially watch glass spectacles, which are the only ones that protect the whole eye. The mica spectacles are sold at Breslau for for about eightpence, English money, a piece. They would be, of course, a few pence dearer in this country, as carriage, duty, commission, etc., would add to the expense. But, at all events, their cost would be exceedingly trifling when compared with the very serious expense, loss of time, and pain that are caused to iron workers by the frequent accidents to their eyes. No doubt, Mr. Raphael will soon establish an agency for the sale of mica spectacles in this country, and we shall then hear more about them. As it is, we strongly recommend our metal workers to look into so important a matter.—*Mechanics' Magazine.*

MANUFACTURING MINING, AND RAILROAD ITEMS.

The State of Michigan possesses several very important coal mines, the products of which are well suited for use in machine shops, on railways, steamboats, or for domestic purposes. Last year 9,000 tuns were turned out from one mine, representing an aggregate value of about $31,500. The whole production of the State for 1867 was about 25,000 tuns, representing a value of $97,000, and as the business seems destined to rapidly increase, it can justly be regarded as one of the most promising sources of Michigan wealth.

The Pacific railroad company's bridge across the Missouri river at Omaha is to be one of the most substantial and expensive structures in this country. The bottom cord will be fifty-five feet above high water mark, thus avoiding the necessity of a draw. The truss is to be constructed of iron, supported by substantial stone abutments and piers. The estimated cost is $2,500,000, and its completion, it is thought, will require two years.

There is a serious quarrel between the Atlantic and Great Western railroads, and a combination of all the railroads companies running East out of St. Louis. It has been customary at all the offices of the railroad companies starting directly from that city, to sell the through traveler tickets for any connecting route he chooses to take beyond these lines. The A. & G. W. road is a broad gage, connecting with the Erie. Its business relation with St. Louis is so large as, in the opinion of its managers, to justify the opening of a separate office in that city. This step caused the other roads to refuse to sell through tickets by that route, but the manager of the A. & G. W. road, forseeing this, and having bought up a large number of tickets, retaliated by reducing the through fare to New York from $36 to $28. Meanwhile, with this and the late Erie reduction, the traveling public are reaping the benefit of the wars.

The same company that work the famous California borax lake, own also sulphur bank near it, estimated to contain 20,000 tuns of this material, from which they extract from six to ten tuns of sulphur per day. Some portions of the deposit are unusually pure, containing not over 10 or 15 per cent of foreign matter. The demand for the article in the State of California alone, amounts to 1,200 tuns annually, the chemical works taking 500 tuns, the powder mills calling for 600 tuns, the watch factories and miscellaneous works absorbing the balance.

Rich deposits os copper ore have been discovered in Polk county, one of the most mountainous sections of East Tennessee. Where the boundary lines of Tennessee, Georgia, North Carolina and South Carolina approach each other, there the spiral back-rocks of several ranges of mountains and high ridges seem also to converge, and this vicinity is rationally supposed to comprise a great metallic field, of which the copper mines opened at Ducktown are but the outcropping. The mines, as far as opened, are scattered over a plateau of five or six miles extent, and elevated 1,500 feet above the sea. One of these mines yielded over one million pounds of refined copper last year.

The Pacific Mills, of Lawrence, Mass., were the fortunate recipients of the prize of $2,000 in gold, awarded at the late Exposition for its success in securing harmony between employers and employed, and in advancing the welfare of the operatives. The Exposition gave ten awards for superiority in this respect, and among five hundred competitors, nine were bestowed upon establishments from continental European countries, none from Great Britain and this one from the United States.

A large and enthusiastic meeting of the business men and capitalists of Cleveland, Ohio, was held last week, to take action concerning the building of a broad gage railroad through Cleveland to Sandusky, Toledo, and the West. Resolutions were adopted pledging the sympathy and capital of the city to aid the enterprise, and a committee was appointed to raise funds.

At Mosey Creek, on the East Tennessee and Virginia railroad, thirty miles from Knoxville, a New York company, at an outlay of $200,000, have just completed their extensive zinc works of twenty-four furnaces. The ore is found on the spot, and is manufactured into the oxide or "flour" of zinc, from which zinc paint is made. Eight furnaces already in operation turn out one hundred barrels per day.

A St. Louis telegram asserts that experiments have been carried on for the past few montes in reducing Iron Mountain ore to pig metal, with what i known as Big Muddy coal. The final trial, just completed at Carondolet, six miles below that city, has shown that the coal contains less sulphur than any other known, and metal can be made from it at less than twenty dollars per ton.

Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents.

VALVE GEAR FOR STEAM ENGINES.—S. S. Jamison, Jr., Salisbury, Pa.—In this invention the valve gear is worked directly by the crosshead, the engine being thereby greatly simplified, and the power that operates the valves being more economically applied, than in any other engine.

LUBRICATOR.—Erastus Johnson, Wilkins, Pa.—In this invention the body of the oil cup is made of metal, its ends being of glass. The screw plug that regulates the flow of the oil is operated in a novel manner and a new method of packing the oil cup, so as to render it air-tight, is adopted.

OYSTER RAKE.—Asa Barrett, Baltimore, Md.—This invention is a simple and and easily operated device by which oysters can be fished up from great depths.

SELF-ACTING DOOR.—G. M. McMahan, Mt. Sterling, Ky.—This invention is a door for houses, so constructed and operating that, while at other times it remains closed, it will automatically open upon the approach of any pers who desires to pass through.

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PLOW.—B. W. Sutherlen, Freesoil, Mind.—The object of this invention is to enable the plowman to ride, and at the same time hold and manage his plow n any soil as perfectly as by the old method of holding it, and with the outlay of but a small part of the labor and strength required by the old method.

SHINGLE MACHINE.—H. G. McDuffee, Bradford, Vt.—The subject of this invention is the machine for planing shingles, clapboards, etc., in which an endless apron carrier is used. This invention consists in employing a series of beds on the surface of the carrier, which hold, guide, and govern the shaping and bevel of the shingles or clapboards, as they pass under the planer.

CAR COUPLING.—David V.B. Smart, Troy, N. Y.—This invention relates to a new method of constructing couplings for securing railroad cars together, whereby the self-acting coupling is greatly simplified, while its effectiveness and durability is equal to any in use.

PIPE CUTTER.—John De Galleford, Cohoes, N. Y.—This invention relates to a pipe cutter which is so arranged that although the cutter is held with great power against the rule or pipe to be cut, the support of the pipe in the device will still yield to eccentric projections on the face of the pipe, or to inequalities in the pipe, so that no undue strain will be occasioned by such projecting portions or inequalities, without which scarcely any ordinary pipe or rule is ever made.

BUTTONHOLE LINING FOR CARRIAGE CURTAINS.—John Barclay, Attleborough, Mass.—This invention relates to the manner of lining buttonholes for carriage curtains, and has for its object to strengthen the edge and to facilitate the fastening and unfastening from the knob, as well as to prevent the spontaneous release of the curtain from the knob.

DETACHABLE BALL JOINT.—Henry Brevoort, Brooklyn, N. Y.—This invention relates to a device for securing the ends of straps, cords, chains, or other articles to some stationary or other device, in such a manner that the attachment may be perfectly secure and may still be easily disengaged whenever desired.

SPECIFIC FOR SCARLET FEVER AND DIPHTHERIA.—S. P. Sedgwick, Wheaton, Ill.—This is a specific for the cure of the above diseases.

PRINTING HATS ON BLOCKS.—Alfred Barnes, Newark, N.J.—This invention relates to a new manner of printing hat bodies with suitable designs, and consists in printing the same while they are yet upon the blocks or cones after pouncing.

ATMOSPHERIC CHURN.—D. C. Hall, Hannibal, Mo.—This invention has for its object to furnish an improved atmospheric churn, simple in construction, easily operated, and which shall be so constructed that warm or cold air may be forced into the churn to bring and keep the contents of said churn at the proper temperature.

SHINGLE AND HEADING MACHINE.—James E. Austin, Oswego, N. Y.—In this invention a new apparatus is provided for heading and pointing the shingles, and it is so constructed that by throwing a portion of it out of gear the stuff can be sawed into thin boards of a uniform thickness suitable for barrel heading.

MACHINE FOR TURNING OFF LOCOMOTIVE CRANK PINS IN THE WHEEL.—W. Blythe and N. Hayes, Alexandria, Va.—The object of this invention is to obtain a cheap, portable device by the use of which the crank pins of locomotive wheels can be easily turned off without removing them from the wheel.

CYLINDER FOR HANDLING LEATHER.—J. W. Lull, Glen Hope, Pa.—The object of this invention is to facilitate the handling of leather during the process of manufacture in tanneries,

SPOKE MACHINE.—Geo. W. Felts, Carbondale, Ill.—In this machine the spokes are placed in a movable frame and held against the knives. The latter are attached to revolving wheels borne backward and forward by a carriage worked with a screw.

DRAIN PLOW.—John Masters, Waukegan, Ill.—This invention combines with a new form of plow a new device for adjusting it and a new arrangement of the wheel by which the working of the elevator is improved.

JIG SAW.—Bernard Demming, Cleveland, Ohio.—In this invention a new device is adopted for adjusting the saw at any inclination, to either side, for the purpose of bevel sawing, and another for regulating and adjusting the rake of the saw.

CAR REPLACER.—Samuel S. Jamison, Jr., Salisbury, Pa.—The object of this invention is to provide a device which can be conveniently carried at all times on the train, and which will enable the engine or cars to be readily replaced on the track when thrown off. It is so constructed that its several parts can be placed in position for use on either side of the rails and in whatever direction the train may be moving.

CHILDRENS' HIGH CHAIR.—John Nichols, Gardner, Mass.—This invention has for its object to so improve the construction of childrens' high chairs that they may be arranged as high chairs for the children to sit at the table, for play chairs having tables in front of the chairs to receive the playthings, or simply as low chairs, and which shall at the same time be easily and quickly adjusted for use in either form.

NUTMEG GRATER.—John G. Roth, New York city.—This invention has for its object to furnish a neat, simple, and effective nutmeg grater which will do its work quickly and well, using up all the nutmeg.

IRONING BOARD.—George J. Birch, New York city.—The object of this invention is to provide an ironing board which may be conveniently used and which may be folded together into smaller compass when not required for ironing or pressing clothes.

HAND CORN PLANTER.—Daniel Broy, Springfield, Ill.—This invention has for its object to furnish an improved corn planter so constructed and arranged that the seed may be divided or scattered when dropped, and which shall at the same time be simple in construction and convenient and effective in operation.

SWING SHEEP FEEDER.—Amos Putnam, Vernon, Wis.—This invention has for its object to furnish a means by which sheep may be fed quicker and with less annoyance than is possible where the feeding is done in the ordinary manner and with the ordinary means.

PLANING MACHINE.—O. P. Furman, Addison, N. Y.—This invention has for its object to furnish an improved machine by means of which the plane surfaces of turned work may be accurately and conveniently planed whether said plane parts be square or polygonal in their cross section.

PROPELLING VEHICLES.—Thomas Rhoads, Fiskilwa, Ill.—This invention relates to the propelling of vehicles for practical use and consists of the spring and wheel work mechanism attached thereto.

ICE PITCHER.—Robert Holmes, Middletown, Conn.—This invention is designed to obviate the difficulty attending the lack of a proper support for the inner wall of the pitcher. This inner wall requires to be very firmly secured in position and its bottom thoroughly well supported, as the latter is liable to be forced off or the soldered seam or joint, by which it is connected to the side, ruptured by dropping heavy pieces of ice into the pitcher. Beside this contingency, the inner wall, when the pitcher is filled with water containing ice, is very liable to give laterally when the pitcher is tilted to pour water from it, and the soldered seam or joint by which the upper end of the inner joint is connected to the external wall, frequently breaks or becomes ruptured under the weight. This invention fully obviates these difficulties, and to this end it consists in leaving the bottom or base of the pitcher which is attached to the external wall, detachable, and connected to said wall by a screw joint so that it may be very readily detached whenever necessary, said bottom being provided at the center of its upper side with a step or projection to receive a pendent pin at the center of the bottom of the inner wall. By this arrangement the inner wall is firmly supported both laterally and vertically so that the bottom of the same cannot be forced out nor the upper joint or seam ruptured.

APPARATUS FOR BREWING, MALTING, DISTILLING, AND DRYING.—Andrew Barclay Walker, Warrington, England.—This improvement has for its object the facilitating of the process of brewing and distilling by attemperating the atmosphere in the gyle tun rooms, or the atmosphere immediately surrounding the gyle tuns, or attemperating the vats by a direct application of the air to the same to that degree of temperature in summer or winter by which the process of vinous fermentation may be most successfully conducted, never allowing the temperature to rise above or fall below that degree of temperature, during which the azotic constituents of the worts become most speedily oxydized by the oxygen of the atmosphere, and further, the maintenance of that degree of suitability or uniformity of temperature throughout the process of fermentation.

WEATHER STRIP.—James R. Mills, Macon City, Ala.—The object of this invention is to prevent the weather, or, in other words, the wind and rain and snow from being driven under doors into dwellings.

COMBINED HIGH AND LOW PRESSURE ENGINE.—Thomas L. Jones, Natchez, Miss.—In this invention the engine is so constructed that when the pressure of the steam in the exhaust end of the cylinder is more than 15 lbs. to the square inch, or more than balances that of the atmosphere, the steam exhausts into the open air; but when the pressure falls below that of the atmosphere, the steam exhausts into the condenser; thus causing the engine to act, during a part of the stroke, on the non-condensing, and during the remainder on the condensing principle.

ROTARY ENGINE.—Samuel S. Jamison, Jr., Salisbury, Pa.—This invention relates to that class of rotary engines in which the steam is applied to a revolving cylinder, one side of which works against an abutment, and consists in so constructing the cylinder and the abutment that the engine is greatly simplified, and the cost of it reduced, while the power of the steam is utilized to great advantage, and the parts of the engine can be readily adjusted and made tight, should they at any time work loose.

MACHINE FOR TENONING SPOKES.—James L. Parker, Harrisonburg, Va.—This invention is an improvement in the construction of tools for cutting spoke tenons by machinery, whereby the instrument is simplified and rendered more effective in operation than those hitherto in use.

CORN PLANTER AND PLOW.—T. H. Frampton, Hopewell, Ohio.—In this invention a seed box and distributing arrangement are attached to and used in connection with a common plow, the distribution of the seed being regulated in a novel and very convenient manner, by hand. A new device is also employed for adjusting the pitch of the two rear teeth.

DEVICE FOR LIFTING HOT DISHES.—S. J. Talbott, Milford, N. H.—This invention relates to a device for lifting hot dishes from a stove, oven or warmer, so that they may be placed upon a table or tray with the greatest facility, and without danger of burning the hands or fingers.

STOVE.—Harvey Brown, Harlem, New York city.—This invention relates to an improvement in the construction of stoves, such as are designed for the operations of cooking, washing, and other purposes connected with housekeeping. Its object is to construct a stove in such a manner that it may be readily taken apart and adjusted together, be portable, like an ordinary open furnace, and also be capable of being used as an ordinary fixed stove.

COOK FORK.—Hiram Smith, Des Monies, Iowa.—This invention relates to an improvement in cook forks, and consists in a novel attachment for the same, whereby articles of food taken up from a dish or any culinary vessel, may be shoved off from the tines of the fork without the application of the thumb or fingers thereto, or without scraping them off at the side of a dish.

WATCH PROTECTOR.—Carl Baumann, Poughkeepsie, N. Y.—This invention relates to a watch protector, composed of a C-shaped plate fastened in the vest pocket, and of a wire ring fastened to the lower part of the plate. The watch is held between the ring and plate, and can only be extracted by drawing the upper part of the ring away from the plate, which can only be done effectually by hand, and if the watch is pulled without drawing the ring and plate apart, as aforesaid, it can never be removed. A hook is formed at the lower end of the plate to serve as a support for the watch, and to prevent the removal of the same from underneath.

BOLT AND RIVET TRIMMER.—Aaron B. White, Meriden, Mich.—This invention relates to an improvement in a machine for cutting or trimming bolts and rivets, an operation which has usually been performed with hammer and cold chisel.

TRACE CLIP.—Peter Schoonmaker, New Britain, Conn.—This invention relates a new device for securing the hold-back ring to the hames, and consists in securing the said ring to the trace clip, and not directly to the hames, as heretofore generally done.

HARNESS ATTACHMENT.—George M. Zell, Waynesville, Ohio.—The object of this invention is to dispense with the use of the ordinary tugs or traces to harnesses, and by the improved attachment embraced herein it is satisfactorily accomplished, and in such a manner as to enable a horse to be attached and detached from the shafts of the vehicle with the utmost dispatch and ease, it requiring but the buckling and unbuckling of one buckle.

FIRE GRATE.—W. D. Guseman, Morgantown, West Va.—This invention relates to an improvement in fire grates, for which Letters Patent were granted June 13th, 1863. The present invention consists in providing the grate with a projecting part, which is some distance above the grate and projects over or beyond the front of the same, so as to catch all dust which may emanate from the grate, and cause it to enter the flue, said projecting flue also increasing the draft of the grate. It also consists in combining with the projecting front aforesaid a sliding blower or screen.

COMPOSITION FOR ROOFING.—Henry W. Johns, New York city.—This invention consists in compounding the fibrous mineral known as asbestos with pigments oil, coal tar, mineral pitch or asphaltum, wood, tar, resin, varnish, and the like, or kindred compounds of any of these, with other minerals, as ground slate, marble dust, sand, clay, lime, and the like, with asbestos, whereby a coating for roofing and other purposes is obtained, which is water proof, fire proof, and otherwise indestructible by the elements. Other analagous compounds for roof cements and plastic preparations for which asbestos is the chief ingredient are provided by this invention. A cement of proper consistency to be applied with a trowel for joints and fissures in stone, metals, and wood, and for repairing leaks in roofs, may be made of the same ingredients.

COTTON OR HAY PRESS.—J. Wentz, Girard, Ala.—This invention consists in applying the mechanical expedient familiarly known as a toggle joint for the purpose of pressing cotton, hay, or other like substance, into a bale.

UPSETTING MACHINE.—J. F. Sargent, Tunbridge, Vt.—This invention relates to the compressing or upsetting so called, of iron tires, bands, bars, rods, or other metallic bodies of longitudinal dimensions. It consists of a pair of bearers, operated by an oscillating disk, to which they are connected by links, the said levers having projecting arms which, when operated bear down upon the iron bar or rod with the peculiar upsetting motion.

HORSE HAY FORK.—S. M. Hoagland, Franklin, Pa.—This invention relates to those forks which consist of two pivoted tines, and which are used to load or unload hay by means of a horse.

DRAFT ATTACHMENT TO CHIMNEY.—H. J. Weed, Cazenovia, N. Y.—This invention relates to a new manner of arranging metal chimney caps, so that the draft will be facilitated by wind, and so that the free discharge of products of combustion is not obstructed.

CAPS FOR OIL CANS AND OTHER VESSELS.—Josiah H. Noyes. Center Abington, Mass.—This invention consists in the combination of a revolving cap or cover, with the neck and mouth of the can or vessel; the construction of my improvement being such that when the cap is revolved in one direction the can or vessel will be opened, and when the cap is turned in the contrary direction, the can or vessel will be closed.

LAMP BURNER.—J. Homer Smith, Brewster Station, N. Y.—This invention relates to a lamp burner, which is so arranged that its flame cannot pass through the wick tube into the oil reservoir, even if the wick should not fit close within the tube. It consists in arranging two feeding cylinders opposite each other, and on opposite sides of the tube.

GAS LIGHT REFLECTOR.—Wm. J. McLea, Buffalo, N. Y.—This invention relates to an improvement in the construction of gas light reflectors, and consists in connecting ordinary reflectors with an apparatus of jointed and sliding rods and pliant gas tubes, in such a manner that the reflectors may be moved in their position.

GATE.—E. M. Naramore, North Underhill, Vt.—This invention relates to a new and useful improvement in constructing and operating gates for fences and house yards, and similar purposes.

ADJUSTABLE SCROLL INDEX FOR GEAR-CUTTING MACHINERY.—W. M. Galusha, Arlington, Vt.—This invention relates to an index for gear engines, and for engine lathes, on which gears are cut, and its object is to produce a cheap, simple, and durable index, which can be easily understood and managed. It consists in the use of a disk, in the face of which a spiral groove is cut, in which groove one or more perforated plates are arranged, so that they can be moved freely in the grooves.

MACHINE FOR SMOOTHNG LOOKING-GLASS FRAMES AND OTHER UTENSILS WITH SAND PAPER.—G. F. Hammer, Cincinnati, Ohio.—This invention relates to improvements in the construction of a machine for rubbing and smoothing the surface of looking-glass and picture frames.

RAILS FOR RING SPINNING.—Cyrus B. Morse, Rhinebeck, N. Y.—This invention relates to an improvement in the construction of rails for ring spinning and their connected machines.

BROOM HEAD.—Albert Alden, East Cambridge, Mass.—This invention consists in a new manner of securing the corn to the head, and in the construction and arrangement of the different parts which constitute the head. The stub ends of the broom corn or brush are laid over a wooden or other bar, so as to be held between the same and the cross bar of the broom head, to which the handle is secured. The said bar is secured to the cross head by means of screw bolts and the sides or the corn are confined between side springs or leather or elastic bands. The two halves of the broom on both sides of the aforesaid bar are connected by a thread, wire, or cord, which is passed through holes or slots in the bar.

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What machine is required to clean the outer hull of the castor oil seed? (not the covering or shell of the kernel,) and what is the cost of such a machine? Address E. Parker, M.D., Abbeville, S. C.

Lead pipe and sheet lead—for a superior article address Pittsburgh Lead Pipe and Sheet Lead Works, Pittsburgh, Pa., No. 167 Smithfield st.

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EXTENSION NOTICES.

Collins B. Brown, of Upper Alton, Ill., having petitioned for the extension of a patent granted to him the 11th day of July, 1854, for an improvement in harvester rakes, for seven years from the expiration of said patent, which takes place on the 11th day of July, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 22d day of June next.

Hymen L. Lipman, of Philadelphia, Pa., having petitioned for the extension of a patent granted to him the 11th day of July, 1854, for an improvement in eyelet machines, for seven years from the expiration of said patent, which takes place on the 11th day of July, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 22d day of June next.

Albert S. Southworth, of Boston, Mass., having petitioned for the extension of a patent granted to him the 10th day of April, 1855, and reissued the 25th day of September, 1860, for an improvement in plate holder for cameras, for seven years from the expiration of said patent which takes place on the 10th day of April, 1869, it is ordered that the said petition be heard at the Patent Office on Monday the 9th day of August next.

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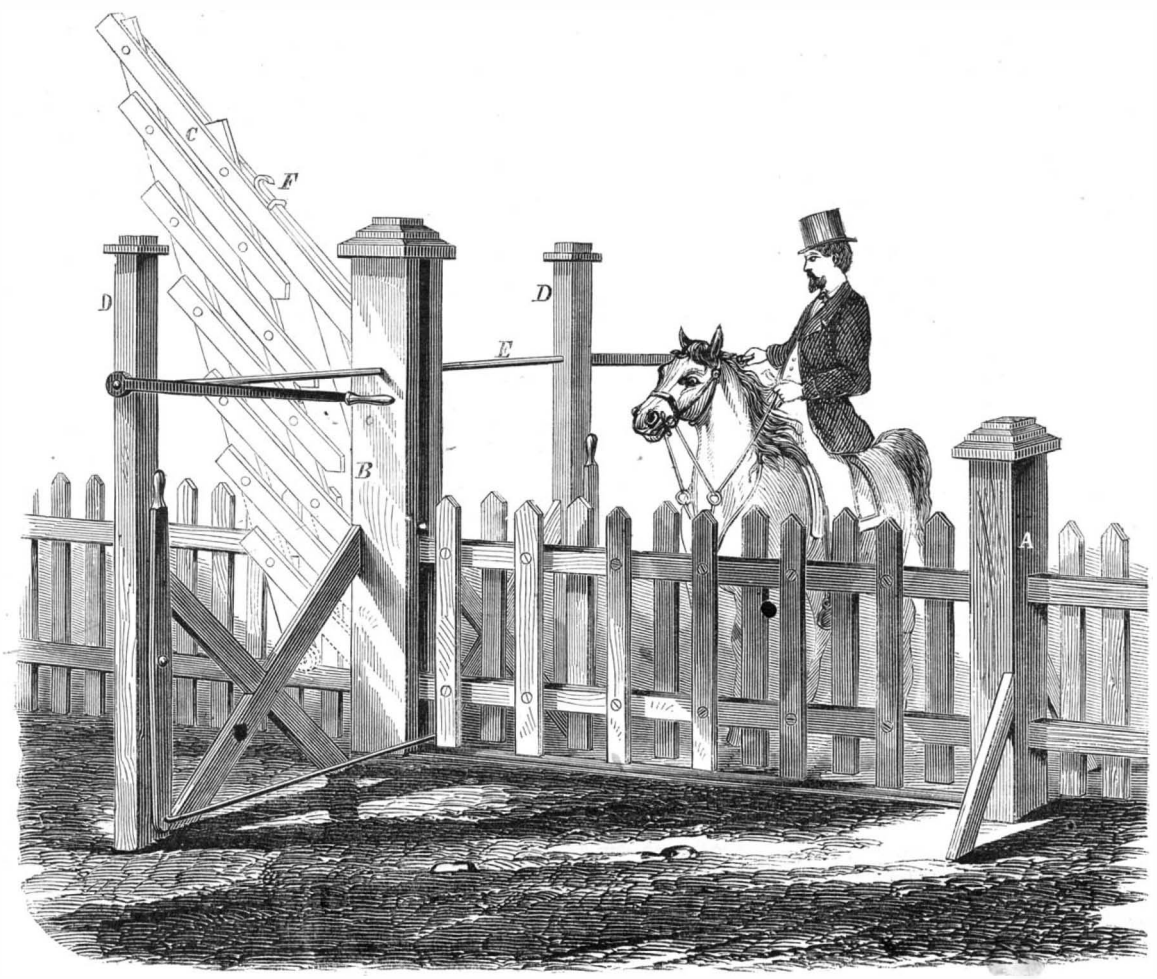
Improvement in Automatic Gates.

The accompanying engraving presents a view of a gate intended for carriage ways and general use on the farm or elsewhere. Folding gates of various styles have largely superseded those supported by and swinging on hinges, as the latter are continually getting out of order on account of the weight being supported wholly by the hinges. The gate herewith illustrated appears to be well adapted to the purpose designed.

A and B are posts connected by a sill on which there is a rail. The post, B, is slotted or double, and is considerably higher than the gate, which consists of one or more horizontal bars to which are pivoted a series of vertical pickets, as seen. The inner ends of the bars are pivoted to an upright in the post, B, shown at C, outline sketch, and the outer end of each horizontal bar carries a small roller which traverses the track on the sill in the process of opening and closing the gate. There are two posts, D, in line with B, which support a horizontal shaft, E, to which the upright bar, C, of the gate is pivoted. At each end of this shaft are handles, projecting nearly horizontally when the gate is closed, which are intended for opening the gate from a carriage or from on horseback. To the shaft, E, in the center of the post, B, is secured a lever, F, which engages with a pin on the upright bar, C. When the levers, or handles attached to the shaft, E, are depressed, the gate is opened and elevated into the position shown by the outline; it will close by its own weight. When it is required to fasten the gate open it may be done by moving the upright levers pivoted to the posts, D. They are moved simultaneously, being connected at the bottom by a rod, and engage with the levers on E. Thus the gate may be opened and held in that position until the traveler has passed, when a movement of the upright lever will disengage the handles of the shaft, E, and allow the gate to close.



GIDLEY'S PATENT FOLDING GATE.

Patented through the Scientific American Patent Agency Dec. 24, 1867, by Robert Gidley, whom address for rights, etc., at Freedom Plains, Dutchess county, N. Y.

Improvement in Revolving Harrows.

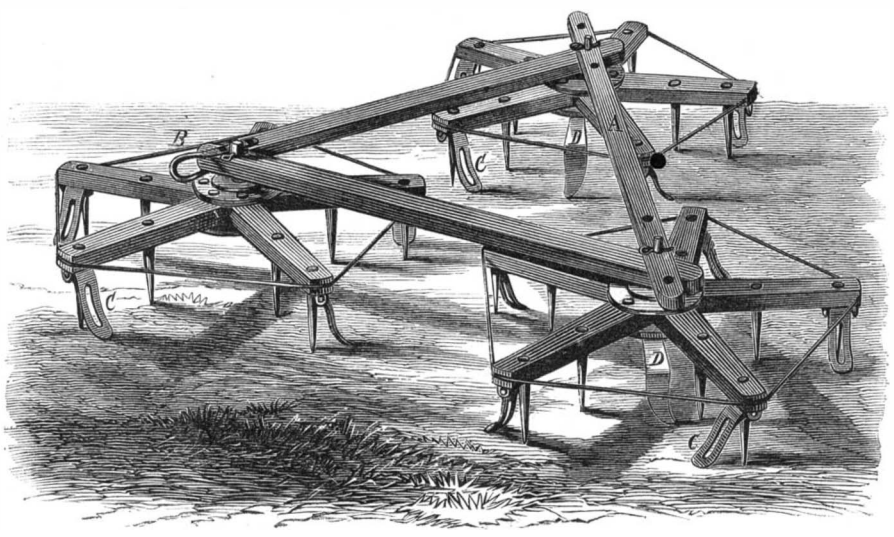
Pulverization of the soil and changes of the position of its particles are necessary to successful agriculture. The soil for growing plants should be loose and open for the accomodation of the small roots and for the admission of light and air. To this end, and to afford nutriment to plants, the particles of soil should be separated, clods and masses broken up and pulverized. This work is done with the harrow, but the ordinary drag harrow is a great absorber of power, and the revolving harrows which have, in some instances, taken its place, possess some objectionable features. The inventor of the harrow herewith illustrated believes that all the objections to revolving harrows are removed by his improvements.

The machine is triple, there being three revolvers connected by bars, the one marked A being an extension bar. The forward ends of the two others are connected by a simple clevis, B, to which the draft is attached. The arms of the revolvers are firmly secured in a double metallic hub, which carries the axle, and they are armed with two rows of teeth, an inner and an outer row. Attached to the arms, directly behind each outer tooth, is a scraper or paddle, C, which is hinged so as to swing freely out from the tooth, and when it comes back it is held vertically by the tooth. The inner teeth have no scrapers but revolve close to a colter, D, projecting from the center of the revolver.

In operation the paddles, being hung loosely on one side of the teeth, will, on one side of the revolvers, present themselves in front of the teeth, while on the other side they will offer no resistance to the passage of the teeth through the soil, as they will lie flat on the surface until they pass the line of draft, when they immediately plunge in and are held by the teeth vertically until they again pass the line of draft on the other side. The action of these spades, or paddles, is somewhat different from what the casual observer would suppose. While the revolvers, with their teeth and spades, are turning, they are, at the same time, being drawn through the soil. After passing the line of direct draft, the motion of each individual spade, in succession, diminishes to a stop at an angle of about forty-five degrees to the line of draft, and it remains inoperative until the axle has passed by, when, at about the same angle in the rear, it starts diagonally and edgewise forward, with a slight curve. Every tooth is kept clean from weeds, roots, etc, the outer ones by the slots in the spades, C, and the inner ones by passing the colter, D. The two rear revolvers turn outward in opposite directions so that all stones and roots are thrown to the outside and rear. By taking off the front revolver the machine becomes an excellent cultivator for corn, cotton, and other crops, taking two rows at a time. When the extension bar is spread it will harrow a width of eight feet.

In construction the harrow is very simple, having no parts to get loosened or lost, there being no nuts nor separate bolts. The under sides of the arms have iron straps let in for holding the teeth securely, which is further assured by a common wood screw passing through the flat heads of the teeth and being seated in the wood. The machine can be taken to pieces for ease of transportation and put together in a few minutes.

Patented through the Scientific American Patent Agency, March 26, 1867, by Caleb Bates, who may be addressed for rights or machines at Kingston, Mass.



BATES' PATENT REVOLVING AUTOMATIC HARROW.

Odoriferous Constituents of Wine.

It is well known in perfumery that freshly distilled waters have not the pleasant smell, particularly when they are prepared from newly culled plants, which they acquire after a lapse of time. So it is with wine, which requires cellaring to obtain its "bouquet." Oenanthic ether, a fluid which was first examined by Liebig and Pelouze, is generally supposed to occasion the vinous odor, but we find on examination that it does not. The odor of this ether is something like wine which has been exposed to evaporation, and is far from being agreeable; it masks in young wines the fragrance of aromatic principles, which do not appear till the oenanthic ether has undergone decomposition.

Brandy, which is added to port wine, in the proportion of one twelfth, may at first be detected by its smell, but after lying three years, the smell will disappear.

The most odoriferous ingredients predominate in wines containing free acids—tartaric acid, for example. Very sweet wines, however, such as those of Turkey, Spain, and Italy, are much less fragrant than those of France and the Rhine. Among the many peculiar odoriferous principles whose existence has been ascertained in wine, we will only mention the most important: Acetic ether appears in most, if not in all aromatic wines, and is developed in them by time. The adulterators of wine are well acquainted with this fact, and know how to make use of it. Both butyric and caprylic ether, very volatile liquids, with the odor of pine-apples, have also been found in it. Caproic ether, which has the smell of melon and golden zeineth and acetate of capryl, are other singularly fragrant ingredients. The pelargonic ether, a fluid found in remarkable quantities in Irish whisky, and the capric ether, which is met with in the fusil oil of potatoes, are also present in the fermented juice of grapes. Acetal appears to be principally found in Hungarian wines.

Nothing, perhaps, will prove more strikingly the fallacy of the common text-book theory, that sugar only undergoes one process of fermentation, viz., that into alcohol and carbonic acid, than the presence of so many of the above ingredients. And we might add that not all vegetables which contain sugar, and ferment, will yield alcohol, since onions, though they are very saccharine, will yield entirely different products when fermented.

The simple fact that a few drops of wine, left in a bottle, will cause the latter to retain the vinous smell for weeks, is sufficient to show how very strong the odor of those principles must be, and still they do not appear in greater quantities than $\frac{1}{10000}$ by weight.

The bouquet of wine is much improved by the etherial oil, which is found in the grape blossoms, and is best imparted to the wine by collecting and drying them carefully, and putting a little packet filled with them in the must. This method was recommended by the celebrated Linnaeus, on the ground that the flavor of Smyrnian wines had been much improved by it.

Schubert evaporated wine till only one fifth of its original volume remained, and then confined it in a bottle, when at the end of five years, he found that it had a bouquet like wine of one hundred years of age. He therefore holds that the bouquet has nothing to do with the alcohol; but this view is certainly erroneous, since we detect many compounds of alcohol among the odoriferous constituents of wine.

Air Fermentation.

The patentee claims the mode of impelling air of proper temperature and moisture into the fermenting substance from below, for the purpose of more thoroughly fermenting the whole mass, and controling the progress of the fermention. He conceived this process with the view of a proper treatment of grape juice in California, but soon became aware that it would equally benefit any kind of fermentation. Should light wines prove less profitable than strong wines, the impelling of very dry air into the must will effect a partial concentration by evaporation of some water, and the time for ripening such qualities of wine—generally three to five years—reduced to a few months.

It is amply proved that air is a necessary agent to fermentation, and the method of impelling air has lately received high recommendation by an eminent German chemist and wine expert, Mr. Frings, in his reply to a consultory letter by the Commissioner of the Agricultural Department for the proper treatment of American wines. Mr. Frings expresses it as the only rational method of treating American wines to impart to them stability, purity of taste, and speedy ripeness.

That the process has similar advantages in the manufacture of superior beer, the quick and regular swelling of malt-corn, a more thorough conversion of all sacharine particles of the mash into alcohol, beneficial in fact to all fermentation is apparant. Patented August 6, 1867, by R. de Heureuse, San Francisco, Cal. C. W. Schumann, 42 Nassau street, New York city, is agent for the Atlantic States.

Lunar Vegetation.—A German astronomer, Prof. Schwabe has been closely examining certain dark lines which by the aid of the telescope may be seen extending across the slopes of the highest mountains in the moon. These streaks have been explained variously, some believing them to be the beds of dried-up streams, others, the channels left by torrents of lava. Prof. Schawbe claims to have discovered in these lines a greenish color which appears at certain seasons, lasts a few months, and disappears. He regards them as belts of vegetation

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NEW YORK, SATURDAY, MAY 2, 1868.

Contents:

(Illustrated articles are marked with an asterisk.)

*Hydraulic Cow Milking Machine. 273
The Chemistry of Tobacco 273
Editorial Correspondence 274
Manufacture of French Leather. 275
The Watch—Its History and Manufacture..... 275
*Morse's Plan for Centering and Picking Bobbins 276
Embalming 276
*The Excelsior Grinder for Mowing and Reaping Machines..... 276
Science in a Toy..... 276
*Improved Copy Holder for Compositors 277
*Hilbert's Self-acting Lubricator.. 277
Spontaneous Generations..... 277
Process for Casting Steel under High Pressure 277
*Do We See the Sun as Soon as it Rises?..... 277
*Optical Illusions 277
Improved Compound of Aniline Colors..... 278
Protection of the Eyes of Metal Workers 278
Manufacturing, Mining, and Railroad Items..... 278
Recent American and Foreign Patents 278
Extension Notices 279
*Improvement in Automatic Gates 280
*Improvement in Revolving Harrows 280
Odoriferous Constituents of Wine 280
Air Fermentation..... 280
The Principle of the Giffard Injector..... 281
Is There Any Thing New Under the Sun?..... 281
Pacific Railroad Progress 281
A Remarkable Gas Well..... 281
History of the Watch..... 281
Manufacture of Enameled Cloth.. 281
Primeval Vegetable Life 281
Crystallization 281
Steam Pressure on the Slide Valve 281
Patent Claims....282, 283, 284, 285, 286

THE PRINCIPLE OF THE GIFFARD INJECTOR.

Probably there is no mechanical device in common use which is such a puzzle to mechanics and others as the Giffard injector. Its operation seems to defy the best known laws of the equilibrium of fluids, yet it acts effectually, and under some circumstances is preferable to the pump for feeding boilers with water.

Its construction is simply a pipe fed from the steam space of the boiler to the water space, below the water level. The steam-leading pipe is contracted at its lower extremity, between the steam and water level, in a space which is filled with the feed water, a fine jet of steam acting against the feed water and forcing it into the reception pipe through a small aperture. Of course, necessary valves and cocks are employed.

A correspondent asks, what is the principle employed in the action of this injector? We cannot state it more clearly, so far as it is understood, than to give the opinion of Mr. John Robinson, of Manchester, Eng. He says: "The pressure on all parts of the interior of steam boilers being equal, some reason must be sought why steam taken from one part is able to overcome the resistance opposed to its entrance in another part of the same boiler. If a pipe conveying steam were turned directly back into the water of the same boiler, it is evident that equilibrium would ensue and no effect be produced. If, on the other hand, a break were made in the continuity of the pipe, so as to leave an interval open to the atmosphere, steam would rush from one pipe and water from the other in the boiler with a velocity proportioned to their different densities. In constructing the injector, the feed water chamber is placed at the break in the pipe, and this arrangement accounts for the power of the steam to overcome the resistance to its entrance into the receiving pipe of the boiler. The jet of steam, being concentrated on the water, forces its way through the interval surrounded by feed water, by contact with which it is gradually condensed, and reduced in volume and velocity, until it is entirely converted into water at the throat. In doing so, it imparts to the feed water a velocity proportioned to the pressure in the boiler and its own temperature; and, the water being non-elastic, it acquires sufficient momentum to overcome the resistance in the water space of the boiler."

In short, the action of the injector is simply mechanical. The same principle has been lately applied—somewhat modified—in attempts to use liquid petroleum as fuel for steam boilers. But, whatever may be the advantages of the injector under some circumstances, it is not always economical. It is a great convenience on locomotive and other engines where the boiler cannot be fed by ordinary devices except when the machinery is in motion, and it is inconvenient or impossible to have a "donkey" engine. The injector cannot work as hot water as the pump and the feeding must be very gradual, as the apertures of the pipes are very small.

IS THERE ANY THING NEW UNDER THE SUN?

A few days ago, being in the rooms of a scientific association in this city, our attention was directed to a book, the title page of which stated that it was published in Rome in 1685. It was a translation from a German work by Cornelius Meyer, and profusely illustrated with copperplate engravings. It was a heavy quarto, printed in large type, on coarse linen paper. Its title, "*L'Arte, Direstituire à Roma la Tralafciata Naugatione del fuo Tenere*," showed that its subjects were mechanics and science. In it we found fascine bridges and causeways for military purposes, the piles on either side being driven by hand with a huge mallet, and fascines and earth being brought to fill the space between the piles. Other bridges, but with string pieces between the piles, are also illustrated. Then there are several illustrations of coffer dams of double rows of piles driven by a floating pile driver, filled in with clay, and with laborers inside removing the earth. Inclined planes for canals and rivers in passing boats around falls, and others for hauling logs from the water, to be sawed by a mill, with reciprocating upright saw driven by a breast water wheel are shown. Also diverting the currents of streams from washed shores by jetties built at an angle with the stream—a plan which we shall again speak of, as it has formed the subject of a paper in relation to the currents of the Mississippi, that we shall quote from hereafter.

This old book is quite a curiosity in its exhibitions of devices that are now subjects of patents. Evidently the inventions, or the principal ones, were never put to a practical test, but it is remarkable that most of them, not only in action but design, closely resemble the devices used for similar purposes in our day.

PACIFIC RAILROAD PROGRESS.

At the close of 1867, there were 650 of the 1,800 miles between Omaha and San Francisco spanned by the iron rail. By the close of 1868, we are promised 500 miles more, and by the 1st of July, 1870, the locomotive will make the entire distance between New York and the Golden City of the Pacific in about six days' time. No railroad enterprise was ever carried out with such dispatch before. When we consider that the two back-bone ranges of mountains are being crossed at elevations of 7,000 feet above sea-level, the magnitude and energy of the undertaking become more vivid. Both the powerful companies, who are building the line from opposite ends, are making commendable headway—the Central Pacific on the western half having 10,000 men at work, and the Union Pacific at this end having a force of 5,000.

The Pacific Railroad, therefore, may be set down as an assured, enduring success. There will be no lack of means or effort to finish it. The Government furnishes about half the cost of building, and private capital will do the rest. Already the line is paying more than its expenses on local traffic. What will it do when the through line is finished? By reference to the advertisement of the Central Pacific Railroad Company on the last page of this number, it will be seen that the six per cent gold bonds, based on a first mortage of the road, are offered for sale at their par value in currency.

A REMARKABLE GAS WELL.

Mr. F. Bowen, writing to us from Burning Springs, W. Va., gives the following description of a wonderful well, emitting gas at a high pressure. He says: "I will attempt to give you some idea of an immense gas vein here, which may be interesting to you and your readers. The well is 900 feet deep, four inch bore with a two inch pipe leading from it, more than a mile long, supplying 28 boilers of 12 horse power each, 50 stoves, and many lights, beside those which spring from leaks along the line, in consequence of the great pressure. I am now writing before a brilliant light on the counter, an engine of one horse power pumping water over the house, and the waste gas running two stoves. My gas is brought through one half and three quarters inch pipe and yet I am obliged to cut it off outside to produce the proper pressure. I believe the pressure is not less than 200 pounds to the square inch. The gas is nearly pure hydrogen with some carbon; it soon, however, mixes with the atmospheric air and thus becomes illuminating."

HISTORY OF THE WATCH.

We commence this week a series of articles on the construction of watches from the pen of H. F. Piaget, one of the oldest makers and repairers of watches in this city. The writer is the author of a book having the above title, which will be found advertised on another page.

Manufacture of Enameled Cloth.

The ordinary enameled cloth is prepared without the use of rubber among the ingredients, and, although heat may be used to some extent in some parts of its preparation, it is not vulcanized. This kind of enamelled cloth is very extensively used in covering furniture and cushions, for carriage curtains, and other similar purposes, but is liable to crack when exposed to cold, and is not reliable for wear as water proof.

The nature of this invention consists in adding a percentage of plastic rubber, or rubber prepared with any suitable solvent, as the ordinary rubber cement, to the ordinary ingredients used in preparing the enameled cloth, and enameling the same with the ordinary processes. The percentage of rubber should not be less than one sixteenth, and not more usually than one quarter, according to the purposes for which the cloth is to be used. This gives to the material additional tenacity and toughness, with additional pliability in all variation of temperature and under all ordinary wear. The usual ingredients used in preparing the ordinary cloth are litharge and boiled oil, the litharge being used in large quantities, to give weight and body to the coating. Processes have been devised for making a kind of waterproof or leather cloth, in which less than two per cent of rubber was used, but the main ingredient was resin or pitch, with a mixture of sulphur and lampblack. This, however, without the rubber, makes a coating differing materially from that upon the ordinary enameled cloth, and, with the rubber, makes a coating entirely different from this. A better preparation, however, and one more particularly used, is a mixture of boiled linseed oil, litharge, burnt umber, and plastic or dissolved rubber, each one part; but while these ingredients are used, these precise proportions may be varied according to the thickness and quality of the stock and material required. The coloring, final varnishing, and finishing, may be such as may be desired for use. Recently patented by E. M. Stevens, of Chelsea, Mass.

Primeval Vegetable Life.

The *Revue des Deux-Mondes* contains a curious article by M. G. de Saporta on vegetable life during the earliest ages of the world. The strange forms of antediluvian animals have been revealed to us in various ways; a fossil bone, nay, sometimes the mere print of a paw in hardened clay, have at times been sufficient to reconstruct the whole creature with tolerable approximation to truth, as subsequent discoveries have proved. The same method of investigation is now being carried on by those who are endeavoring to revive the flora which existed at a time when England, for instance, was peopled with kangaroos. A leaf, or the mere impression of one, found either in a lump of coal, or on a fragment of some hardened sediment, will at once tell the botanist to what genus of plants it is to be referred; and as observation discovers new facts, the species themselves, generally different from those of our days, are gradually distinguished and classified. It is thus we have at length reached a point from which we may pretty nearly guess what a primeval landscape looked like. Instead of the endless variety of form which lends such beauty to our plants and stately forest trees, we may picture to ourselves a uniform and gloomy prospect of dreary land, here and there interspersed with clusters of reeds, lepidodendrons, arborescent ferns, and similar straight and formal growths; but no soft grass, no daisies, or other wild flowers. Generally speaking, foggy heavy weather must have been the rule, and rains exceedingly frequent. This was during the Permian period; the Jurassic one was characterised by the prevalence of cycadeæ, a family of plants much resembling the palm, and peculiarly remarkable for their very slow growth. They are now chiefly to be found under the tropics. Our present vegetation seems to have made its first appearance during the subsequent, or cretaceous period. The development of the animal kingdom was evidently subordinate to that of the vegetable one; for beasts of prey could not live without herbivora, and these could not make their appearance until there was grass for them.

Crystallization.

A very curious discovery has recently been made by M. Auguste Bertsch, and turned to practical account by M. Kuhlmann, the celebrated chemist. Who is there that has not, during cold winters, stopped to admire the beautifully symmetrical and yet fantastic figures of leaves and flowers depicted on the window panes of a well-heated room, the air of which is charged with aqueous particles? M. Bertsch has found that Epsom salts (sulphate of magnesia) dissolved in beer, together with a small quantity of dextrine (artificial gum), and in this state applied to a pane of glass with a sponge or brush, will, on crystallizing, produce the identical designs above alluded to, hitherto considered peculiar to water; with this improvement, however, that the liquid may receive any color whatever, at the option of the operator. The ephemeral productions of frost may thus be easily perpetuated; but M. Kuhlmann, on being apprised of the fact, conceived the idea of going a step further, and transferring those fairy-like creations to stuffs and paper. For this purpose, he first got the crystallizations on sheets of iron, on which he afterward laid one of lead; by means of a powerful hydraulic press the minutest details of the figures in question were durably imprinted on the soft metal, and a copy of them in relief was then obtained by galvanoplastics. But here another difficulty arose; in the impression of cotton stuffs the pattern must be continuous; whereas in M. Kuhlmann's plates the lines at one end would clearly not coincide with those at the other, so that disagreeable interruptions would be caused in the printed designs. This obstacle, however, has been overcome in a most ingenious manner by effecting the crystallization on the cylindrical surface of a roller. A slight rotary motion imparted to it will prevent the liquid from accumulating at any particular point before it has evaporated.

Steam Pressure on the Slide Valve.

A correspondent, J. C. S., of Pa., writes as follows: "What amount of steam pressure is there on a slide valve in a steam chest of an engine, the valve being six inches long by five wide, the two steam ports four inches by one, and the exhaust port four inches by one and a half, with 80 pounds on steam gage? There are different opinions on this matter; some say the full 80 pounds pressure are on the thirty square inches contained in the face of the valve; others say the actual pressure is only on the number of square inches contained in the ports. I desire your opinion." The question of the pressure on the slide valve has been agitated for a long time. It is somewhat intricate. We will suppose the valve to be placed covering all the ports, with 80 pounds of steam per square inch on it. If the valve is tight it is plain that the pressure on it is thus: 30 square inches multiplied by 80 pounds, equal to 2,400 pounds, provided no steam gets underneath it. But, put the valve in motion, and the induction and eduction of steam takes place, of course giving a counteracting pressure under the valve, tending, in a degree, to resist the pressure on the top or steam side. Valves that are set so as to close the exhaust before the piston arrives at the termination of the stroke, of course compress the remaining vapor in the cylinder, thereby relieving the pressure on the steam side.

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OFFICIAL REPORT OF PATENTS AND CLAIMS

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PATENTS ARE GRANTED FOR SEVENTEEN YEARS, the following being a schedule of fees:—

On filing each Caveat	$10
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
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On application for Reissue	$30
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On granting the Extension	$50
On filing a Disclaimer	$10
On filing application for Design (three and a half years)	$10
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In addition to which there are some small revenue-stamp taxes. Residents of Canada and Nova Scotia pay $500 on application.

☞ *Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to Inventors, may be had gratis by addressing MUNN & CO., Publishers of the Scientific American, New York.*

76,579.—HOSE COUPLING WRENCH.—Albert F. Allen, Providence, R. I.

I claim the signal hose wrench, constructed substantially as herein described, with a socket, D, the spanning horns, B, and handle, H, for the purposes set forth.

76,580.—STEAM GENERATOR.—John F. Ailen, Tremont, N.Y.

I claim, 1st, The arrangement of a number of chambers, A, of an oval or circular section, with circular forward end, and strengthened by braces or division plates, b, inclined upward, for the purpose described, in combination with hanging tubes or pipes, D, the whole being constructed in the manner and for the purpose substantially as set forth.

2d, The combination of the above-described chambers, A, with hanging pipes, D, water chamber, K, steam chamber, J, and connecting pipe, M, when constructed and arranged substantially as described and specified.

76,581.—DECARBONIZING IRON.—J. F. Allen, Tremont, N.Y.

I claim, 1st, Purifying iron from its carbon and other impurities, by causing the molten iron, contained in a revolving cylinder, to pass in the shape of a shower or spray through atmospheric air or other oxygen-bearing gas or vapor passing or being forced through the revolving cylinder containing the iron, substantially in the manner as set forth and described.

2d, The construction of the revolving cylinder, A, with suitable lining, C, provided with holes or cavities, n, on the inner circumference, in the manner and for the purpose substantially as set forth and specified.

76,582.—WINDOW SASH STOP.—Franklin Ball, Wilton Junction, Iowa.

I claim the combination of notches, H H, with the face plate and thumb piece, K, of a shaft, D, and catch, A, of a window fastener, all substantially in the manner and for the purpose herein set forth.

76,583.—FLOOR CLAMP.—George E. Banner, Newark, N. J. Antedated April 7, 1868.

I claim the jaw, J, the sliding bar, L, and screws, K, in combination with the lever, D, ratchet, E, joint bar, C, main stem, B, with its foot, H, the whole being constructed and arranged to operate substantially in the manner and for the purposes specified.

76,584.—VISE.—Charles Barnes, Cincinnati, Ohio.

I claim, 1st, A bench vise, adjustable around two centers, at right angles to each other, substantially as set forth.

2d, The arrangement of cheeks, G and I, with tubular stems, F and H, capable of being slid one within the other, and secured within the divided yoke C, vibrating about a vertical stem, B, in combination with the nut, b, and screws, E and J, for regulating and fixing the adjustments.

76,585.—STEAM BOILER FURNACE.—Samuel P. Bartley, Columbus, Ohio.

I claim the funnel-shaped chamber or passage, D, in combination with circular or curve in rear of chamber, O, and the cold air pipe, E, constructed and operating substantially as and for the purpose described.

76,586.—BREECH-LOADING ORDNANCE.—Peter R. Beaupre, Metropolis, Ill.

I claim, 1st, The construction of breech-loading cannon, with the joint between the breech and barrel formed as described, with the center of the trunnions of the breech piece placed above the center of the bore, for the purposes specified.

2d, The breech strap, C, in combination with the expansion screws, F, provided with the clutch pin, T, substantially as and for the purpose set forth.

76,587.—GUN LOCK.—Salmon Belden, and John Frankling Crabtree, Visalia, Cal.

I claim 1st, The lever, F, having a short arm connected with the tumbler by a link, and a long arm, to be held by the trigger, when at full cock, and released when the trigger is drawn for discharge, substantially as described.

2d, The safety catch, consisting of the lever, n, spring, p, and lever, r, together with the notch, o, shoulder, u, and the pin, v, the whole combined and operating substantially as and for the purpose described.

76,588.—CLUTCH FOR ELEVATING.—C. C. Blodgett, Watertown, N. Y.

I claim the clutch elevating and operating device herein described, of the accompanying drawings, arranged to operate in combination with a clutch or grapple, substantially in the manner and for the purposes shown and set forth.

76,589.—ADJUSTABLE CLOTHES DRYER.—H. Storrs Boynton, Cortland, N. Y.

I claim the mode of constructing and operating an adjustable clothes line upon wheels or pulleys, and regulated by weights consisting of the line, L, in combination with the wheels, S S', and the weights, O X, and axles, E E', with the posts, P P', and framework, B B', all constructed and operating substantially as set forth.

76,590.—HOT-AIR FURNACE.—Edward Brady, and John Sloan, Philadelphia, Pa.

We claim furnace, F, compartments, W W', dome, D, heating chamber, H C, air pipes, A P, movable top, T, cistern and evaporation boxes, R and R', connecting pipes, S P, S P', S P'', and C P, evaporation boxes, W B, smoke and gas escape apertures, O, all constructed and combined and operating in the manner and for the purposes above set forth and described.

76,591.—LUMBER DRYER.—Joseph Brakely, Bordentown, N. J.

I claim, 1st, The chamber, A, and case, B, used in combination with the pipes, H E, and G, whereby I am enabled to apply heat to the chamber by means of steam, and at the same time draw off and utilize the vapor from chamber, A, as and for the purpose set forth.

2d, The use of a pipe leading from the lumber chamber into the pipe which supplies steam for heating said chamber, for the purpose of drawing away and utilizing the hot vapor from the lumber, substantially as herein set forth.

76,592.—LAMP BURNER.—John W. Brimblecom, Lynn, assignor to William Carleton, Charlestown, Mass.

I claim a lamp burner, in which the deflector is capable of being adjusted, with respect to the wick tube, laterally, or in the direction of the length of the slot in the said deflector, substantially as and for the purposes herein shown and described.

76,593.—COTTON PRESS.—R. M. Brooks, Woodbury, Georgia.

I claim, 1st, The metal pieces, G G, and J, having flanges, e e, and d d, and used with the cross head, F, all constructed and used as specified.

2d, The straps, P P, and N N, used in combination with the metal pieces, G G, and straps, E, all constructed as and for the purposes specified.

76,594.—COTTON GIN.—R. M. Brooks, Woodbury, Georgia.

I claim the guide boards, D D, used in the chamber, B, of the roll box of a cotton gin, and operating as and for the purpose set forth.

76,595.—BREECH-LOADING FIRE-ARM.—John Broughton, New York city. Antedated October 14, 1867.

I claim, 1st, The combination of the swinging breech piece, B, which, in opening, swings down through the open bottom of the breech receiver, the swinging recoil brace, H, working upon an axis, h, arranged, relatively to the axis of the breech piece, in or nearly in the same plane, perpendicular to the face of the closed breech piece; the lever, E, pivoted to the lower and rear portion of the swinging breech piece, and acting centrally upon the front of the brace, H, and through it upon the hammer, the spring or springs m, held in place by the trigger pin, n, and acting on the rear of the brace, H; the hammer, G, vibrating on the axis, h, independent of the brace, H, and with its head working relatively to the breech receiver, in such a manner that the slot in the upper surface of the receiver, through which the comb of the hammer projects, is filled by the said head both at the "down" and "full cock" positions of the hammer, the whole arranged and constructed to operate together, substantially as herein shown and described.

2d, The firing pin, D, constructed in the form of a hammer, and swinging within, but sufficiently independent of, the swinging breech piece, upon the same shaft or axis as the breech piece itself swings upon, as herein described.

3d, The hook, K, spring, L, and sector, J, in combination with each other and with the swinging breech piece and extractor, substantially as and for the purpose herein specified.

76,596.—CAR STAKE HOLDER.—George A. Brown, Kalamazoo, Mich.

I claim the combination of the plates, L, catches, J, circular projection, E, arms, d, and gravitating bolt, D, when constructed and arranged substantially as described, and for the purpose set forth.

76,597.—HORSE RAKE.—Nathaniel H. Brown, Derry, N. H., assignor to himself and Joseph A. Veazie, Boston, Mass.

I claim the teeth, a, with their wooden heads, b, in combination with the bars, D E, and the springs, m, constructed, arranged, and operating substantially as described.

Also, the device for elevating the teeth, a, consisting essentially of the arm or lever, G, in combination with the crank, H, operated substantially as set forth.

76,598.—POST HOLE AUGER.—Allen Burton, Chicago, Ill.

I claim, in combination with the hollow handle, A, the rod, C, arranged within said handle, and operating in the manner and for the purposes set forth.

76,599.—FILE FOR GROOVING ROLLS.—Henry L. Butts, Norwich, Conn. Antedated March 28, 1868.

I claim the within-described tool, as an article of manufacture, constructed and used as and for the purpose herein specified.

76,600.—MACHINE FOR ATTACHING BUTTONS TO FABRICS.—George J. Capewell, West Cheshire, Conn. Antedated April 9, 1868.

I claim the bent lever, A, with elbow and journal formed of one piece, the conical formed, adjustable set screw, d, and spring, e, when combined and arranged substantially in the manner and for the purposes specified.

76,601.—SWING CRADLE.—Patrick P. Carroll, Washington, D. C.

I claim the spring arm, F, connecting rod, G, and wrist crank, R, as arranged and combined with gear mechanism for swinging a car or cradle, substantially as and for the purposes herein set forth.

76,602.—BEEHIVE.—John I. Cassel, and Wm. Quin, Eaton, Ohio.

We claim the hinged bottom, C, in combination with the perforated bottom of the honey box, P, all constructed substantially as and for the purpose set forth.

76,603.—RUBBER FOR WASHING CLOTHES.—James Charlton, Allegheny city, Pa. Antedated April 1, 1868.

I claim a rubber for washing clothes, said rubber consisting of parts, A and A', provided with handles, B, and corrugated face, f, and hinged together as herein described.

76,604.—SHUTTLE FOR LOOMS.—Silas E. Chase, Boston, Mass.

I claim the combination with the body of the shuttle, of the plug or base, f, and the bobbin spindle, with its appurtenances, hinged to said base, substantially in the manner and for the purposes herein shown and set forth.

76,605.—SAND CAP FOR CARRIAGES.—A. O. Coleburn, and H. T. Standard, Wayne, Mich.

We claim the adjustable sand caps, c h, applied in connection with an axle and hub, as and for the purpose described.

76,606.—CHURN.—Andrew J. Conner, Louisville, Ky.

I claim the combination of the churn, M, the shafts or double dashers, K K, with the wings or blades, L L, and the lid or cover, I, when arranged, and operating in the manner set forth.

76,607.—STEAM GENERATOR.—Benjamin Crawford, Pittsburg, Pa.

I claim the arrangement of a perforated plate, m, over the mouth of the steam pipe, g, inside of the boiler, in combination with the pipe, g, for the purpose hereinbefore described.

76,608.—LEATHER TRIMMER.—Lewis P. Curtis (assignor to himself and Justin D. Barker), Marlboro, Mass.

I claim the knife or cutter, E, attached to the awl or needle carrier of a machine for sewing leather, and operating substantially as and for the purpose specified.

76,609.—NECK YOKE.—Albro S. Dow, and Elijah W. Wilcox, Cedarville, N. Y.

We claim, 1st, Constructing the attachment, which connects the neck yoke to the tongue or pole, with a swivel joint, formed as described, that is to say, by the combination of the socket, B, projection, E, and bolt, F, substantially as hereinbefore set forth.

2d, The combination of the metallic strap or case, C, and the leather ring, or its equivalent, D, said case, C, being so constructed as to support the said ring, D, in front and at its edges, or beneath the pole, as described, said ring, D, being secured in position by screws, or other equivalent device, and the space behind said ring, D, being left open, substantially as described.

3d, The combination of the pad, K, with the metallic ring, which embraces the pole or tongue, in such a manner as to interpose the said pad between the tongue and that portion of the case, C, which lies directly between the said tongue and the under side of the neck yoke, substantially as and for the purpose set forth.

76,610.—SCRUBBER.—Jacob Edson, Boston, Mass.

I claim the combination and arrangement of a series of fine holes made in the reservoir, as described, with such reservoir, the strip of rubber and the valve, and valve opening applied to the reservoir, as set forth.

Also, the arrangement and combination of the burred plate, with the reservoir, when the latter is provided with a valve, D, and a strip of rubber arranged as set forth.

Also, the combination and arrangement of the guide tube, e', with the reservoir, provided with a cleaning strip, and a valve and valve operating lever, and holes of admission and emission, arranged as set forth.

76,611.—IMPROVED MORTISE AND TENON FOR BEDSTEADS.—William H. Elliott, New York city.

I claim, 1st, Cutting the shoulder, d, on one piece of wood, and the shoulder, e, on another piece of the same material, and fastening the two together, substantially as described, when said shoulders so operate upon each other and upon the post as to make the fastening self tightening, as herein set forth.

2d, The double tenon, c and c', when so constructed and applied that it shall become self tightening when in use, and at the same time serve the purpose of a cleat to prevent warping or checking, substantially as herein shown and described.

3d, The combination of pin, g, double tenon, c and c', side rail, b, mortise, h, with its depressions, h', cut in the material of the post, all being constructed and operating substantially as described.

76,612.—SCREW-CUTTING LATHE.—Charles Ellis, Canton, Mass.

I claim, 1st, The holding chuck, I, in combination with the self-centering chucks, substantially as described.

2d, The combination of the self-centering chucks, D and D', the holding chuck, I, and the revolving die holder, M, substantially as described.

3d, The combination of the chucks, D and D', and I, the revolving die-holder, M, and the tool carriage, U, when made substantially as described, and for the purpose specified.

4th, The adjusting collars, a and b, right and left screws, G G', in combination with the sliding jaws of a chuck, so that the said jaws shall always have their corresponding faces at an equal distance from the center of revolution.

5th, The employment, in combination with the right and left screws, G G', of tee adjustable collars, a b, by which the jaws are centered, substantially as described.

76,613.—BRICK PRESS.—John M. Enos, St. Joseph, assignor to himself and Thomas Swartwout, Kalamazoo, Mich.

I claim the combination of the frame, D D', lever, L, arms, G H, plunger, F, platform, A, slide, B, mold box, C, spring, S, and rod, I, arranged to operate substantially in the manner and for the purposes set forth.

76,614.—CURB FOR STREETS, ROADS, ETC.—Oliver Faurot and William Pond Harris, Brooklyn, N. Y.

We claim the construction and arrangement of the curb, as shown by the accompanying drawings, with the brackets, flanges, bolts, lugs, connecting blocks, bearings, supporters, etc., in the manner and for the purpose herein described.

76,615.—MACHINE FOR CUTTING CORKS.—Luther W. Felt, Keene, N. H.

I claim, 1st, Giving the required degree of taper to the cork to be cut by regulating the amount of vertical play of the collar, Q, upon the revolving shaft, K, substantially as described.

2d, Regulating the amount of vertical play of the collar, Q, and consequently the degree of taper to be given the cork, by the rod, S, in combination with the post, B, lever, 36, link, 40, and yoked bar, R, with its ring, 27, operating substantially in the manner set forth.

3d, The blocks, O O, made removable for regulating the diameter of the cork to be cut, substantially as set forth.

4th, The grooved blocks, O O, in combination with the cutters, P P, substantially as and for the purpose set forth.

5th, Introducing a current of cold air within the center of the table, b, so as to impinge upon the edges of the cutters immediately after a cork has been cut, substantially as described.

6th, The "spring catch," H, operated by mechanism, substantially as described, to allow of the rod, J, being thrown up, at and for the purpose set forth.

76,616.—OIL CUP.—Charles Ferger, New York city.

I claim as my invention the combination, with an oil reservoir or oil cup for oiling the bearings, of a valve closed by spring, K, and raised at intervals by a positive motion, communicated by the pin, Q, or its equivalent, the parts being constructed as herein set forth.

76,617.—BRICK MACHINE.—George B. Fisher, Chicago, Ill.

I claim, 1st, The combination of a series or chain of blocks, E, with a polygonal mold wheel, B, arranged and operating substantially in the manner and for the purposes set forth and shown.

2d, In combination with a revolving mold wheel, B, provided with plungers operating as described, the arrangement of the removable cams, D, and their supports, F, substantially in the manner and for the purposes described.

76,618.—RASP.—Isaac Fisher, St. Louis, Mo.

I claim a rasp formed of thin blades of steel, a, having one or both of their edges serrated, and held together by means of screw bolts, a', substantially as herein shown and described.

Also, the arrangement of the plates, when their alternate numbers are constructed so as to slide on the connecting bolts, a', at a distance sufficient to place the serrations in transverse rows for the purpose of sharpening, as described and set forth.

76,619.—MACHINE FOR DRESSING AND SCOURING LEATHER.—Edward Fitzhenry, Boston, Mass.

I claim the combination of a series of casters, E E etc., in manner substantially as set forth, with the tablet, A, and its supporting frame, the whole being substantially as described.

And in combination with a series of casters, a tablet and a supporting frame, arranged and composing parts of a machine, as and for the purpose described, an adjustable screw, or its equivalent, applied to each or any of such casters, for the purpose of effecting the adjustment of the caster wheel, or the same and its spindle, with reference to the tablet, in manner as explained.

76,620.—HINGE FOR SLEEPING CAR BERTHS.—Jedediah I. Fogg, Chicago, Ill,

I claim the combination of the boxes, b, and the spindles, d, when arranged with respect to the partitions, B, and berths, C, so as to operate substantially as and for the purposes specified.

76,621.—GUANO DISTRIBUTOR.—Newton Foster, Palmyra, N. Y.

I claim as an improvement in machines for sowing fertilizers, the serrated-edged distributing bar, F, constructed as shown and described, and so arranged that the V-shaped teeth only of said bar shall be exposed to the material to be sown, substantially in the manner and for the purposes set forth.

76,622.—HOSE COUPLING.—R. John Gaines, Portland, Conn.

I claim a hose coupling, the male and female parts or butts of which are constructed substantially as hereinbefore described, and having a movable band or ring fitted upon the female part or butt of the coupling itself, and constructed substantially as hereinbefore to be used in connection with the catches, K K, of fig. 1, and the flange upon the inner end of the female part or butt.

Also, as a part of my device, the small screws passing through said ring, and extending into the grooves under said ring, upon the body of the female part, for the purpose of indicating when the grooves or slots in the said ring are on a line with the slots in the female part or butt, all of which is constructed substantially as hereinbefore described, substantially as and for the purposes herein set forth.

76,623.—MANUFACTURE OF MELODEON STOPS AND OTHER ARTICLES.—John Gardner. New Haven, Conn., assignor to Samuel Peck & Co.

I claim the above-described composition of matter for melodeon stops and other knobs, substantially as specified.

76,624.—APPARATUS FOR SPROUTING MALT.—Joseph Gecmen, Chicago, Ill.

I claim, 1st, In combination with a water chamber, L, and chute, E, the arrangement of a series of floors, constructed substantially as and for the purposes set forth.

2d, The combination of a series of floors, constructed as described, with a chamber, L, and fountain, S, substantially as and for the purposes described.

76,625.—THERMOMETRIC STEAM GAGE.—D. M. Greene, Troy, N. Y.

I claim, 1st, The combination of the reservoir, B, and the exterior steam chamber, I, the glass tube, E, and a pressure gage scale attached thereto, determined by the expansion of the mercury or other fluid, by the heat of the steam conducted from the boiler to the steam chamber, I.

2d, The combination of the reservoir, B, the exterior steam chamber, I, the graduated glass tube, E, placed outside of a boiler having a steam connection therewith by a tube or flange.

3d, The drip tube, attached to the steam chamber, I.

4th, A coating of copper, or other suitable material, when applied to the surface of the mercury cup, substantially as and for the purpose set forth.

5th, The flexible bag, n, secured to the end of the tube, E, substantially as and for the purpose set forth.

6th, The process of graduating the gage, by applying steam to the steam chamber at a series of pressures, determined by a standard gage, and marking the position of the mercury or other fluid corresponding thereto.

76,626.—HARNESS FOR BREAKING HORSES.—Theophilus Hammond, Petersburg, Ind.

I claim the arrangement of the forked bar, C, with its perforated disk, and pulley, D, lever, F, and spring, in combination with the straps, E and R R, and harness, as herein described, all constructed and operating substantially as set forth.

76,627.—SUBSOIL PLOW.—C. R. Hartman, Vincennes, Ind.

I claim, 1st, The concavo-convex and triangular shovel, D, secured to an extended heel piece, d, of the colter, C, and abutting against the shoulder, e, of said colter, substantially as described.

2d, The construction of the colter, C, upon the standard, C', so that the upper portion of the cutting edge of this colter shall form an obtuse angle with the front edge of the standard, C, in combination with the shovel, D applied substantially as described.

76,628.—JACK SCALE.—H. M. Hervey, Madison, Ohio.

I claim the pedestal, A, screw, B, nut, C, and standard, E, as arranged in combination with the weigh beam, F, for the purpose and in the manner as set forth.

76,629.—SWING CARRIAGE.—William Hewett, Trenton, N, J.

I claim the levers, D D, connecting the rods, B B, and the treadles, f f, and secured to the carriage by bolts, e e, substantially as and for the purpose described.

76,630.—BALL CASTER.—Samuel S. Hickok, Methuen, and Daniel B. Clement, Boston, Mass.

We claim the ball caster, made in two sections as herein described, the one section consisting of the base, c, constructed with the slotted legs, h, in which the axles of rollers, e, are held, and the other of the cup, b, with the caster ball which it holds, attached to said base, in the manner and for the purposes shown and specified.

76,631.—MACHINE FOR PRODUCING REDUCED COPIES OF MEDALS, ETC.—Charles John Hill, Regent's Park, England, assignor to Joseph Shepherd Wyon and Alfred Benjamin Wyon. Patented in England April 5, 1867.

I claim, 1st, The peculiar system or mode of an apparatus for ascertaining the correct length or depth of the cutter in relation to the tracer point, substantially as hereinbefore described, and illustrated by the accompanying drawings.

2d, The peculiar system or mode of and apparatus for determining the correct size of cutter to be used in relation to the size of the tracer point, substantially as hereinbefore described, and illustrated by the accompanying drawings.

3d, The employment, in this class of machinery, of removable mandrels, of different sizes, adapted to the various-sized cutters required, as hereinbefore described, and illustrated by the accompanying drawings.

4th, The employment in this class of machinery, of an arm, working on an universal joint at one end, and actuated by hand at the opposite end, such arm carrying an adjustable frame, with cutter mandrel and rotary cutter, and a fixed frame, with vertically-adjustable tracer, the whole being arranged and operating substantially as hereinbefore described, and illustrated by the accompanying drawings.

5th, The peculiar construction of rose cutters, as hereinbefore described, and illustrated by the accompanying drawings.

6th, The peculiar construction of finishing cutter, as illustrated by the accompanying drawings.

76,632.—BRACE FOR BITS.—S.B. Hill (assignor to himself and Levi B. Taylor), Chicopee, Mass.

I claim the slide, a, in combination with the screw jacket, b, both constructed, arranged, and operating substantially as herein described.

76,633.—BED BOTTOM.—Beecher Hitchcock, Waukegan, Ill.

I claim the arrangement of a long spring, I, for the foot of frames, A B, and a short spring, H, for their heads, in combination with side springs, having long arms, C, and short arms, G, substantially as and for the purpose set forth.

76,634.—CULTIVATOR.—Lewis M. Holland, Galesburg, Ill.

I claim coupling the shovel beams, B, with the axle of the cultivator by means of the screw pivots, b, with cross pieces, e, fitting in the sockets of the plates, a, substantially in the manner and for the purpose as herein set forth.

76,635.—PUMP PISTON.—Henry S. Hopkins, Boston, Mass.

I claim, in combination with the flanges, b b, the segmental packing pieces, g, pressed outwardly by springs, and the joint blocks, h, constructed and arranged to operate substantially as set forth.

Also, in combination with the segments, g, the rubber springs, k, placed loosely in the recesses, i, and pressing the segments outward, substantially as set forth.

76,636.—LET-OFF MECHANISM FOR LOOMS.—Daniel Hussey, Nashua, N. H.

I claim the combination of the differential gears, r s t, their ratchets, g v, and holding and impelling pawls, h w, with the shaft, k, of the yarn beam gearing, and with the whip roller or depresser, D, and mechanism for actuating the impelling pawl, h, substantially in the ways as hereinbefore described.

76,637.—CONSTRUCTION OF FENCE POSTS.—Martin Krumm, Jr., Columbus, Ohio.

I claim a transversely-expansible post, A, having its vertical portions united at the top by one or more springs, A', substantially as shown and described.

76,638.—ICE PITCHER.—George Lane (assignor to himself and Benjamin W. Hicks), New York city.

I claim constructing a pitcher for containing ice water, with spouts, F F, trunnions, G G, stand, A, and float, E, substantially as and for the purposes set forth.

76,639.—BUTTER DISH.—Nathan Lawrence (assignor to Reed & Barton), Taunton, Mass.

I claim the combination and arrangement of the spring latches, g g, with the vase, and for the purpose of receiving and holding the bearings or boxes of the journals of the cover, and admitting of their removal, in manner substantially as specified.

76,640.—DEVICE FOR FETTERING HORSES.—A. H. Lewis, North Greenbush, N. Y.

I claim the strap, a, in combination with strap, b, and the loops, e e', as and for the purpose set forth.

76,641.—STOVE POLISH OR BLACKING.—Jerry Lewis, Albion, N. Y.

I claim a mixture, of the ingredients above mentioned, in about the proportions specified, for the purpose set forth.

76,642.—APPARATUS FOR REMOVING HIDES FROM ANIMALS.—Philo Lull, Norwich, N. Y.

I claim the rod, or its equivalent, constructed and operated for the purpose and substantially as herein set forth.

76,643.—PUMP PISTON.—Sylvester G. Mason, Rochester, N.Y.

I claim the combination of the segmental openings, e e, formed as above described, and the valves, G G, resting in said openings, with the segmental packing rings, H H, so arranged as to inclose said valves, and to act as packings, and retain the water in the piston, as herein set forth.

76,644.—CLAMP FOR HOLDING PICKETS.—Peter McCarthy, Rochester, N. Y.

I claim the head blocks, B and B', when constructed with projections, c, and arranged in relation to a clamp, substantially in the manner and for the purpose described.

76,645.—LAMP BURNER.—William C. McGill, Cincinnati, O.

I claim, 1st, The elastic, tubular, and perforated stem, C, substantially as described and shown for the purposes set forth.

2d, The combination of the collar, D, tube, G, ring, F, with elastic wings, f f, all constructed and arranged substantially as shown and for the purposes herein set forth.

3d, The conductor, E, formed and arranged as and for the purpose set forth.

4th, The combination of ring, F, and elastic wings, f, and air conductor, E, when constructed and arranged as herein shown and described and for the purposes heretofore set forth.

76,646.—CONDUCTOR'S REGISTER.—William C. McGill, Cincinnati, Ohio.

I claim, 1st, The actuating knob, H, and teeth, G G, in the described combination, with the recording and striking devices, substantially as set forth.

2d, In the described combination, the half-fare register slide, P, and ticket receptacle or pocket, Q, upon or within a conductor's register, substantially as described.

3d, The double register for recording full and half fares, constructed and adapted to operate substantially in the manner set forth.

76,647.—STAMPING PRESS.—Albert G. Mead and Charles J. Addy, Boston, Mass.

We claim, 1st, The reversible swivel step, a, in combination with the reversible or swivel chuck, d, for the purpose and substantially as described.

2d, The slide, A, and screw, D, and spiral spring, E, or equivalent, when combined with the head, C, of the stand, for the purpose and substantially as described.

76,648.—METALLIC BIRD HOUSE.—Henry Miller, Cranston, assignor to himself and George O. Miller, Johnston, R. I.

I claim the metallic bird house, constructed substantially as described, as a new article of manufacture.

76,649,—CHURN.—Marshal Morse and P. W. Sawyer, Gray, Me.

We claim the single-dash churn, as described, said dash being operated by crank, g, gear, f, pinion, e, crank shaft, d, irregular balance wheel, h, driving rod, i, having the spring catch, k, said churn also having the slides, b, sock-

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ets, c, and slides, o, moving in grooves, n, on divided cover, m; the said driving devices also being intended to be removable, as described, for the purpose of being attached to any common cylindrical churn, and all as set forth.

76,650.—TOILET COMB.—Joseph P. Noyes, Binghamton, N. Y.

I claim, as a new article of manufacture, a comb provided with a metallic back, extended over the ends thereof, so as to form the end tooth or covering therefor, as represented and described, for the purpose set forth.

76,651.—PROPELLER.—Charles M. O'Hara, New York city.

I claim the reversible buoyant propeller, constructed and arranged to operate as hereie described.

76,652.—MOLD BOARD FOR PLOW.—James Oliver, South Bend, Ind.

I claim the mold board, B, annealed as set forth, as a new article of manufacture.

76,653.—LAMP BURNER.—George K. Osborn, Brooklyn, N. Y.

I claim the combination of the jacket, B, surrounding the wick tube, A, the tube, C, placed a little above the wick tube, A, and the passages, D D, running from the bottom to the top of the tube, O, all arranged as and for the purposes specified.

76,654.—INDUCTING COIL APPARATUS AND CIRCUIT BREAKER. Charles Grafton Page, Washington, D. C.

I claim, 1st, An induction coil apparatus, consisting of a primary and secondary circuit, when said secondary circuit is many times, that is to say two, three, or more times, the length of the primary circuit, having the connections so arranged that shocks, sparks and electrostatic results may be obtained from the secondary circuit alone, or from the combined primary and secondary circuits, or from the primary alone, or from portions of either circuit, substantially as set forth.

2d, The combination of an automatic circuit breaker with either a primary coil alone or a primary and secondary coil combined, substantially as set forth.

3d, The combination of a mechanical circuit breaker with a primary and secondary coil combined, substantially as set forth.

4th, The combination of both a mechanical and automatic circuit breaker with a primary and secondary coil, combined substantially as set forth.

5th, The combination of a primary and secondary coil, enclosing an electro magnet, with an automatic circuit breaker, substantially as set forth.

6th, The combination of a primary and secondary coil, enclosing a compound or divided electro magnet, with an adjustable automatic circuit breaker, substantially as set forth.

7th, The combination of a primary or secondary coil, enclosing a compound electro magnet, with an attached hammer circuit breaker, substantially as set forth.

8th, The spark arresting circuit breaker, when used with a primary coil alone, or a primary and secondary combined, substantially as set forth.

9th, The spark arresting circuit breaker, whether used with a coil or coils, enclosing an electro magnet, substantially as set forth.

10th, The spark arresting circuit breaker, whether attached to or independent of the primary or primary and secondary coils, substantially as set forth.

11th, The adjustment of the retractile force of an automatic circuit breaker, substantially as set forth.

12th, In combination with such adjustment, adjusting the distance of the hammer or the armature from the pole or poles of the electro magnet which actuates them, as set forth.

13th, Adjusting or regulating the length of vibration of the circuit breaking bar, by means of a set screw, or any mechanical equivalent, for substantially the same purpose, substantially as herein set forth.

14th, The employment of one electro magnetic instrument to open and close the circuit of another electro magnetic instrument, using either one battery for both or separate batteries for each, substantially as herein set forth.

15th, The employment of separate and independent batteries to operate an electro magnetic circuit breaker, and the circuit which is broken by it, substantially as set forth.

76,655.—CONDENSER.—Wm. Phelan, Peoria, Ill.

I claim, 1st, The two cones, A, B, the space between these provided with a spiral partition, thus forming a spiral chamber, surrounded by cold water, for the purpose of condensing steam or vapor, in the manner indicated.

2d, The supply pipe and valve, l n k, in connection with a condenser of the construction indicated, to supply the incidental waste of water.

76,656.—VISE.—Belvill L. Randall, Roxbury, Mass.

I claim the combination of the jaw, b', and annularly grooved tenon, f, with the base, e, and pin, g, the said parts being constructed and arranged as herein described, and both base and tenon being perforated to receive a pin or bolt for rendering the said jaw immovable when desired, as and for the purposes shown and set forth.

76,657.—SULKY HARROW.—Benj. Randall, Adams, N. Y.

I claim, 1st, The connecting of the sulky to the harrow by means of an elastic bar, C, attached to the front ends of the thills, B B, and to an upright, E, on the front part of the harrow, substantially as shown and described.

2d, The upright, E, attached to the front end of the harrow, and having the whiffletree and elastic bar, C, connected to it, substantially as and for the purpose specified.

3d, The adjustable caster, d, attached to the front end of the harrow, when the same is constructed and arranged so as to operate substantially as described.

4th, The combination of the upright, E, and draft hook, b, when the same are constructed and arranged so as to operate substantially as described.

5th, Attaching the rope, H, to the harrow, substantially as and for the purpose specified.

76,658.—CORN PLANTER.—Benj. Randall, Adams, N. Y.

I claim, 1st, The seed slide, F, and the springs, d d, when the latter are arranged within the seed box, E, and the whole so combined as to operate substantially as described and for the purpose specified.

2d, The seed slide, F, when arranged in relation with the spring, d, cam, H, and the lever, M, substantially in the manner as and for the purposes set forth.

3d, The elastic furrow openers, L, arranged and applied in connection with the shaft, J, substantially as shown and described.

4th, The tube, G, and bar, I, in combination with the covering shares, f, and roller, g, when the same are constructed and arranged substantially as described.

5th, The bar, I, attached to the lower end of the seed tube, G, and provided with the covering shares, f, and roller, g, in combination with the shaft, J, arm, i, and chain, h, all arranged to operate in the manner substantially as and for the purpose set forth.

76,659.—CLOTHES' WRINGER.—Benj. Reed, Allegheny, Pa.

I claim the spring yokes, A and B, in combination with the rollers, C and D, constructed, arranged and operating substantially as described, and for the purpose set forth.

76,660.—MODE OF PRINTING PHOTOGRAPHIC PICTURES.—Isaac Rehn, Philadelphia, Pa.

I claim the combination of the pigment with the salted albumen and silver solution, for the purposes set forth in the above specifications.

76,661.—HORSE HAY FORK.—Andrew Reynolds, Rock Springs, Md.

I claim a single spiral tine, E, secured to a central straight tine, F, so that they both turn while the instrument is being forced into the hay and liberated from it, substantially as described.

76,662.—WAGON JACKS.—Alexander Ross, Freeport, Ill.

I claim a wagon jack having a lock arranged with a loop, F, arm, E, and lug, G, in combination with the lever, C, notched standard, B, and catch, D, substantially as and for the purpose set forth.

76,663.—SPRING MATTRESS.—John W. H. Scott, Rochester, N. Y.

I claim the combination of the springs, E, and the diagonal webbing, C, and the crossing, D, with a proper frame, as specified.

76,664.—BUREAU BEDSTEAD.—Edward Shackford and Derk Arnaud, Boston, Mass.

We claim, 1st, A bedstead made in two parts, hinged together, when arranged with the case and its door, so that the bedstead when in use shall be outside of and parallel with the front of the case, substantially as and for the purpose specified.

2d, The arrangement of the bedstead, A B, and crib, E, with the case and its doors, D G, all substantially as and for the purpose specified.

76,665.—SEE SAW OR TILTING APPARATUS.—Amory F. Sherman, Roxbury, Mass.

I claim the combination of the tilt seats or chairs and a means, substantially as described, of maintaining them in horizontal positions while the tilt may be in action.

Also, the parallel tilting bars, as made with notches or equivalents in their lower edges, as and for the purpose described.

Also, the arrangement and combination of the adjustable double inclined plane foot rest, with the seats or chairs, and the tilting parallel motion bars and boards applied to such chairs and standards, as explained.

Also, the combination and arrangement of the anti-concussion buffers with the tilt, as described.

76,666.—THILL COUPLING.—Geo. C. Smith and Roswell Judson, Matteawan, N. Y.

I claim the coupling strap, B, when constructed and used substantially as and for the purpose specified.

76,667.—BEARING FOR FIFTH WHEEL OF CARRIAGES.—Simon B. Smith (assignor to himself and Joseph K. Chew), Salem, N. J. Antedated March 31, 1868.

I claim, 1st, The head block, a'', the perch' bearing, a''', and the disk, a', when cast together in one piece of metal, substantially as and for the purpose described.

2d, In combination with the combined mechanical devices of the preceding claim, the king bolt, E, when constructed and applied as described and shown, for the purpose specified.

76,668.—STOVEPIPE SHELF.—L. C. Stiles and R. P. Jackman, Elgin, Ill.

We claim the combination of the disk, B, clasp, H, and set screw, L, together with the rotating disk, C, attached to disk, B, all constructed and arranged substantially as and for the purpose described.

76,669.—CAN OPENER.—Nathaniel F. Stone, Chicago, Ill.—Antedated April 1, 1868.

I claim the plate, b, provided at one end with a cutter blade, d, at the opposite end, with a projection or heel, a, in combination with the screws, c c, and the plate or slotted bar, B, substantially as specified.

76,670.—BUNG.—Conrad C. Stremme, Austin, Texas.

I claim, 1st, The combination of the bung with the socket, the bung being secured by means of the teeth, d d, working in inclined slits inside the socket, thereby making a water tight lock for a barrel without shouldering or the use of packing.

2d, The vent or air valve constructed as shown, in combination with the bung, as substantially set forth.

76,671.—DOOR BOLT AND LOCK.—Charles Sulzman, Waterford, N. Y.

I claim the combination of the sliding bolt and locking pin, with its actuating spring, or the grooved wheel or disk, and bridge which it carries, arranged to operate in connection with the bolt, substantially in the manner and for the purposes shown and set forth.

2d, In a bolt or lock such as described, providing the grooved wheel or disk with a bridge or stud capable of being removed from and adjusted to any one of the sockets formed in the annular grove of the said wheel, substantially as and for the purposes shown and specified.

76,672.—MACHINE FOR CURBING WELLS.—James A. Sutherland, Elmwood, Ill.

I claim, 1st, The combination and arrangement of staves, A B, with iron straps, a a, b b b b, and hinge joints, c, as shown in fig. 5, in the manner and for the purpose herein described.

2d, The combination and arrangement of the straps, e e, and pin, f with the staves, A B, in the manner and for the purpose herein described.

76,673.—FLY TRAP.—Geo. J. Swingle, Knoxville, Ill.

I claim the arrangement of the receptacle or prison, A, gauze door, y, trap-cover, B, with prongs, X, cloth screens, b b, trap door, C, rollers, D D, with prongs or curved pins, Z, rod, d, pan, E, and rods, O O, the whole combined and operating substantially in the manner and for the purpose as herein set forth.

76,674.—BED BOTTOM.—Wm. H. Tambling, Mazo Manie, Wis.

I claim the arrangement of the grooved boards S, angular wires, D, bands E, slats, h, and movable bars, F, constructed and used substantially as set forth.

76,675.—WATER TANK FOR STOVES.—Gottfried Tennie, Pittsburg, Pa., assignor to Frank S. Bissell.

I claim the flue box, A, made separate from a boiler, and applied around the flue collar of a stove, so that it serves as a means whereby to support a flue boiler above said collar of the stove, substantially as and for the purposes described.

76,676.—ROTARY STEAM ENGINE.—Flavius J. Van Vorhis and Thomas C. Workman, Stockwell, Ind.

We claim, 1st, The construction of the case, A, substantially as set forth.

2d, The construction and arrangement of the piston, B, and valves, D, substantially as set forth.

3d, The arrangement of the valves, D, with the piston, B, and cam groove, C, substantially as set forth.

4th, The arrangement of the steam passages, i i i, with the valves, D, and the cavities, I, substantially as set forth.

5th, The arrangement of the valves, D, with the passages, H, and ports, E, substantially as set forth.

6th, The arrangement of the reversing valve, e, the steam induction ports, E, and exhaust ports, F, substantially as set forth.

76,677.—SAW MILL.—Londus B. Walker, Chicago, Ill.

I claim, 1st, The frame, B, pivoted as described, and constructed to sustain the feed rollers and their driving wheels, with slots and bolts, or their equivalents, to admit of the vibration of the frame, substantially in the manner and for the purposes specified.

2d, The slides, C C, which carry the feed rollers and gear wheels, in combination with the lever, L, rods, r and t, connecting link and adjusting nuts, all arranged and operating in the manner and for the purposes set forth and described.

76,678.—BOTTLE FOR HOLDING HYDROFLUORIC ACID.—David P. Webster, New York city.

I claim, 1st, The preparation of bottles for receiving hydrofluoric acid, by cutting them internally and externally with asphalt of coal tar, or the herein described composition of gum shellac and india rubber, as set forth.

2d, As an article of manufacture, a bottle made of wood or papier mache, or other like material, coated externally and internally with a composition of varnish not affected by hydrofluoric acid, substantially as shown and set forth.

3d, Making the bottle for holding hydrofluoric acid of wood, and in two parts or sections, united substantially in the manner and for the purposes shown and described.

76,679.—SMELTING LEAD ORE.—David P. Webster, New York city.

I claim the improved process herein described for smelting or reducing phosphurets or phosphates of lead.

76,680.—PULLEY AND GEARING FOR MACHINERY.—Seth Wheeler, Albany, N. Y.

I claim, 1st, The mode substantially as herein described of constructing a pulley or gear wheel so that a portion of its rim and of the metal forming its hub or eye may be readily removed for the purpose of getting it off or on a shaft or axle.

2d, The construction of a pulley or gear wheel in such a manner that its detachable part or parts are held in their proper relation, and the pulley held on the shaft by the action of the same key or screw, or keys or screws, substantially as described.

3d, The jogs, g g', in combination with a key or screw and key, in the construction of a two part pulley gear wheel, substantially as and for the purpose described.

4th, The construction of the arm, B1, of a pulley or gear wheel, substantially in the manner and for the purpose described.

5th, The pulley or gear wheel made in two parts, one of which parts constitutes more than half of the pulley, and the other part less than half, the parts being united and held together substantially as described.

6th, The construction of the parts, B2, of the pulley or gear wheel, substantially as and for the purpose described.

76,681.—PLOW.—Cornelius Wilkins, Dundas, Ill.

I claim, 1st, In combination with the standard, b, of a steel or other similar plow, the bar, C, secured to said standard by bolts or rivets, c, and having a threaded or slotted portion, c', for uniting said standard to the beam, substantially as described.

2d, Securing the colter E, by passing it through an opening b5, in the breast of the plow and fastening it with a bolt or rivet, e, on the inside, substantially as and for the purpose specified.

76,682.—ROTARY VALVE.—Enos D. Wood, Utica, N. Y.

I claim the valves, G, with the openings, H, between them and the hub, E, constructed substantially as described.

76,683.—HAIR CRIMPER.—G. W. Wood, Philadelphia, Pa.

I claim two-tined hair crimper, A, with outwardly curving ends, in combination with the expanding and fastening slide, B, as a new article of manufacture, substantially as shown.

76,684.—CONSTRUCTION OF TEA AND COFFEE POTS.—Douglas B. Woodworth, Cincinnati, Ohio, assignor to the Cincinnati Britannia Company.

I claim the sheath or sole plate, C, of refractory metal, secured beneath the bottom of a Brittania tea or coffee pot, in the manner and for the purpose explained.

76,685.—PROCESS OF TREATING MUSLIN FOR SWEAT LININGS, ETC., FOR HATS.—Wm. P. Wright (assignor to himself and C. W. Walton), Philadelphia, Pa.

I claim the within described process for treating muslin for hat sweats, etc., so as to give it elasticity and pliability, as herein set forth and described.

76,686.—BAG HOLDER.—Jacob Yaggy and Tobias R. Yaggy, Plainfield, Ill., assignors to Tobias R. Yaggy.

We claim the combination of the post, A, the legs, C C, the rim, D, hinged rim, F, and clasp, G h, arranged and operating substantially as and for the purposes specified.

76,687.—LAND TILLER.—Geo. W. Zeigler, Maumee, Ohio.

I claim, 1st, Providing a single beam, A, carrying a gang of plows or shovels, with a draft rod, D, which is pivoted at or near the middle of the length of said beam and supported at or near its front end by means of a laterally vibrating beam, L, substantially as described.

2d, Supporting the front end of a draft rod, D, which is pivoted to the eye, h, of the intermediate stock, B, by means of a laterally and vertically adjustable segmental clevis, N, applied to the beam, L, substantially as described.

3d, The adjustable casting, G, provided with the standard, j, and adjustable standards, l l, for sustaining the handles, J, and allowing these handles to be secured at their front ends by means of a clamping bolt, j, substantially as described.

4th, Providing for adjusting the handle, J, of a single beam plow in line with a draft rod, D, by means of devices, G and L, which are arranged to operate substantially as described.

5th, A metallic standard stock and holder, B, constructed with a curved front edge, b, a swelled corrugated surface head, c, and a slot, a substantially as described.

6th, The wooden shovel carrying standard, C, applied to a stock, B, substantially as described.

7th, The construction of the clevis, N, of a segment form, with a notched flange, p, and also with perforations through it for receiving the draft rod D, substantially as described.

8th, A single-beam gang plow which is provided with laterally adjustable shovel standards, B C, laterally adjustable handles, J, a vertically and laterally adjustable clevis, N, a laterally adjustable arm or beam, L, all arranged substantially as described.

76,688.—BROOM HEAD.—Albert Alden, East Cambridge, Mass.

I claim, 1st, The manner of securing the corn or broom material to the head by clamping its stub-ends between the bars, B and C, and tying it by a string, F, and confining it in position to a band, F, or its equivalent, substantially as herein shown and described.

2d, The broom head, formed by combining the cross head, B, slotted or perforated bar, C, bolts, a, band, E, or its equivalent, and spring, F, with each other, substantially as and for the purpose set forth.

76,689.—CORN PLANTER.—E. W. Allen, Auburn, N. Y.

I claim, 1st, Operating the movable plates, z z, by means of the revolving arms, S S, levers, h h, and spring, L, with its connecting rod, j, the several parts being constructed and arranged substantially as and for the purposes herein set forth.

2d, The combination of the plows, R, double coverers, J J, rollers, K, spouts F, and movable plates, z, operated by the reel arms, S S, springs, L, and rod, j, the whole constructed and used substantially as specified.

76,690.—SPIRIT METER.—J. G. Allen, Philadelphia, Pa.

I claim, 1st, Delivering the spirits into a series of cells, P', provided with strainers at their outlets, substantially as described, to prevent the entrance into the meter of any foreign substances.

2d, The tilting measuring cells, C, provided with the sample spouts, E, arranged to deliver the samples into the funnel, G, substantially as described.

3d, A series of sample chambers or tubes, L', arranged to receive the samples as they are delivered from the funnel, G, through the spout, d, or equivalent means.

4th, Providing a meter with the rotating spout, d, arranged to be operated by the movements of the measuring apparatus, so as to deliver the samples to the sample tubes in succession, substantially as set forth.

5th, Making the sample tubes, L', with double glass walls, as described, for the purpose of preventing the evaporation of the samples by heat.

6th, Providing the sample tubes with a valve, i, arranged to be opened by the movements of the arm, e, or other part of the meter, to permit the entrance of the sample, and be closed again when the sample is in, to prevent evaporation.

6th, Providing the sample tubes with a valve or cock at their bottom, to be opened by the incline, r, on the arm, K, attached to and operated by the disk, H, or equivalent means, to draw off the samples, as described.

8th, Providing a spirit meter with a series of radial tubes, N, so arranged that any material movement of the meter will cause the contents of said tubes to flow out into and be retained in the vertical cups, R, substantially as and for the purpose set forth.

9th, The use of a measuring wheel composed of a series of cells or compartments, C, arranged as represented in fig. 2, and herein described.

10th, Constructing and arranging the measuring cups or cells of meters, as herein described, so that the leverage shall be uniform, whatever the quantity or specific gravity of the fluid being measured.

11th, Making the pipes leading to or from the meter double, or incasing them within a second tube, to prevent tapping them or artificially cooling or heating them, or abstracting liquor therefrom by capillary holes, substantially as described.

76,691.—SHINGLE MACHINE.—J. E. Austin, Oswego, N. Y.

I claim the combination of the pivoted tables, L L, with the sliding blocks, M M, having the shoulders, m m, and operating the tables, substantially in the manner and for the purposes specified.

76,692.—ELEVATOR.—J. S. Baldwin, Newark, N. J.

I claim the withdrawal of the yielding platform or edge, B, by the action of an interposed body, by means and in the manner described.

76,693.—ELEVATOR.—J. S. Baldwin, Newark, N. J.

I claim the checking or stopping of the elevator by the pressure of an interposed body upon the bar, D, or its equivalent, said pressure being transmitted and applied by the means and substantially in the manner described.

76,694.—ELEVATOR FOR TRANSPORTING PASSENGERS.—J. S. Baldwin, Newark, N. J.

I claim the elevator for buildings having floors of varying hight, constructed substantially in the manner set forth.

76,695.—BUTTONHOLE LINING FOR CARRIAGE CURTAINS.—John Barclay, Attleborough, Mass., assignor to himself, R. D. Case, Jas Barclay, and Daniel Bing, New York city.

I claim a carriage-curtain buttonhole lining, consisting of the three annular plates, B C and D, and of the eyelet, E, all made and operating substantially as herein shown and described.

76,696.—DEVICE FOR PRINTING HAT BODIES.—Alfred Barnes, Newark, N. J.

I claim the die, a, operated by the screw shaft, b, whereby a continuous spiral line is printed upon the body of the hat, B, while on the cone, as herein described for the purpose specified.

76,697.—OYSTER RAKE.—Asa Barrett (assignor to himself and M. D. Mettee), Baltimore, Md.

I claim the instrument above described, consisting of the rake heads, A A, teeth, a a, springs, S, and weight, B, in combination with the crossed rods or arms, C C, and the connecting rods, D D, and link, E, substantially as and for the purpose specified.

76,698.—GRADING MACHINE.—W. C. Bartlit, Aledo, and J. M. Merryman, Malone, Ill.

We claim, 1st, The arms, H, when so connected with the frame, A, and scraper, E, as to swing vertically, when the scraper revolves, substantially as herein set forth.

2d, The lock levers, U and V, in combination with the arms, H, and scraper E, when arranged to lock the arms and keep the scraper from revolving, and at the same time admit of the front of the scraper being elevated or depressed to receive its load, substantially as herein described.

3d, The shaft, K, and arms, L, when arranged in connection with the front of the scraper, E, with the lugs, M, and lever, N, or their equivalents, so that the operator can raise or lower the front of the scraper at pleasure, substantially as and for the purposes specified.

76,699.—WATCH PROTECTOR.—Carl Baumann, Poughkeepsie, N. Y.

I claim, 1st, A watch protector, consisting of a spring plate, A, and of the bent rod, B, which is fastened to the plate, and between the upper part of which plate and rod the stem of the watch is clamped, substantially as herein shown and described.

2d, Forming a hook, b, on the lower end of the spring plate, A, of a watch protector, substantially as and for the purpose herein shown and described.

76,700.—RAT TRAP.—Richard Beem, Antrim, Ohio.

I claim, 1st, Arm, F, with its serrated arms, f and f', catch, c, and knob, in combination with main spring, B, and shaft, E, when constructed and operating substantially in the manner and for the purposes set forth.

2d, Spring, I, when constructed and operating substantially in the manner and for the purposes set forth.

3d, Trigger, T, with its guide, G, when constructed and operating with lever, L, and bait arm, n, substantially in the manner and for the purpose set forth.

4th, Arm, F, shaft, E, spring, B, when constructed and operating in combination with spring, I, trigger, T, guide, G, lever, I, bait arm, n, body, A A' and bottom, a, substantially in the manner and for the purposes set forth.

76,701.—IRONING BOARD.—G. I. Birch, New York city.

I claim the combination of the board, A, hinged end frames, B D D B' and E D' D E', with the bottom frame, B'' B'' C C, and hinged slide, n, all substantially as shown and described and for the purpose set forth.

76,702.—APPARATUS FOR TURNING LOCOMOTIVE CRANK PINS.—W. Blythe and N. Hayes, Alexandria, Va.

We claim, 1st, The reversible and adjustable end-centering device, in combination with the outer and inner cylinder, or either of them, when combined therewith, substantially as described.

2d, The exterior cylinder, carrying the tools, S S, in combination with the inner and stationary cylinder, when arranged substantially in the manner set forth.

76,703.—DUMPING PLATFORM FOR HARVESTERS.—Jacob W. Bope, St. Louis, Mo., assignor to himself and George R. Chittenden, Chicago, Ill.

I claim, 1st, A tilting platform or dropper turning upon an axis at or near its rear edge, in combination with a hinged extension or tail piece for adapting said platform for use in tall grain.

2d, A hinged folding extension or tail piece, in combination with an anti-friction rod or guard on the platform, for the purpose as described.

3d, The anti-friction rod, in combination with the tilting platform provided with teeth, operating as and for the purpose described.

4th, A tilting platform or dropper turning on a pivot or fulcrum at or near its rear edge, operated by means of a lever crank or arm attached to said pivot or fulcrum, substantially as described.

5th, A tilting platform or dropper turning upon a pivot or fulcrum located at or near its rear edge, in combination with arm or lever, F, attached to said fulcrum, adjustable rod, L, arm or lever, K, rockshaft, J, and foot piece or treadle, I, substantially as described.

6th, A tilting platform, in combination with a means for adjusting said platform and setting it up or down, or nearer to or further from the cutting apparatus.

7th, The adjustable arm, D', forming the support for the pivot at the inner end of the tilting platform, substantially as described.

8th, The adjustable swinging arm or support, H, in combination with the hook pivot or fulcrum, G, at the outer end of the tilting platform, substantially as described.

76,704.—COAL EXCAVATING MACHINE.—Job Borton, Antrim Ohio.

I claim, 1st, The picks or chisels, M' M', sledges, M M, and cams, c c, operated by shaft, H, and wheel, I, in combination as described, and operating as and for the purposes set forth.

2d, Cam roller, a', on shaft, H, adjustable arm, l l, connecting rod, b, arms, b' and b, on rock shaft, b'', pawl, o, and ratchet wheel, K, in combination with cog wheels, S S, as described, and operating as and for the purposes set forth.

3d, In combination with a mining machine thus constructed, crank shaft, G, balance wheel, F, and gear wheel, K, pitman, N, constructed and operating as described and set forth.

4th, The combination of the chisels or picks, M' M', with the transversible frames, B and C, carrying the intermediate devices, constructed as described and operating as set forth.

76,705.—UMBRELLA.—J. E. Boyce and R. Harrington, Birmingham, Eng. Patented in England, June 17, 1867.

We claim, 1st, The combination, with the umbrella or parasol stick, and studs or projections thereon, of the slotted runner and lever, constructed, arranged, and applied to said runner, substantially in the manner described, so that while the runner rides or passes over the studs, one arm of said lever will engage with one or the other of said studs, and thus fix the umbrella or parasol in its open or closed position, as shown and set forth.

2d, One or more bow springs, made from sheet steel, or other elastic metal, applied to the taperstick of an umbrella or parasol, so as to steady the runner thereon, substantially as herein shown and described.

76,706.—DETACHABLE BALL JOINT.—Henry Brevoort, Brooklyn, N. Y.

I claim, 1st, The ball joint, constructed as described, consisting of the shell A, open at one end, and provided at its opposite end with the slot having the shoulder, b, whereby, as the ball is introduced into the shell, and its shank turned in the wider part of the slot, it will strike said shoulders and be locked in the shell until turned again, so that its narrower part will enable the ball to be withdrawn from the slot, as herein shown and described.

2d, The ball joint, constructed as described, in combination with the bracket B, or screw, B, as herein described for the purpose specified.

76,707.—PORTABLE COOKING STOVE.—Harvey Brown, Harlem, N. Y.

I claim, 1st, The connecting together of the side and end plates, A B, and bottom plate, C, of the stove, by means of the hooks, b i, and slots, a c, substantially in the manner as shown and described.

2d, The pawl, D, and lug, e, in combination with the hooks, b d, and slots, a c, all arranged substantially as and for the purpose set forth.

3d, The lid or cover, E, provided with the inclined plates, h h, for the purpose of admitting of the lid or cover being tightly fitted on the stove, or more or less elevated, as described.

4th, The bent or angular wires, F F, and bail, G, arranged and applied to the stove, substantially in the manner as and for the purpose specified.

76,708.—CORSET SPRING.—S. H. Brown and C. H. Willets, New York city.

We claim, 1st, A corset spring, composed of two parts, b b*, connected so that the spring can be lengthened or shortened, substantially as set forth.

2d, The slide, a*, moving between the parts, b b*, of the spring, A, in combination with the fastening, a', substantially as and for the purpose described.

3d, The adjustable button, c, in combination with an extension corset spring A or A', substantially as and for the purpose set forth.

76,709.—HAND CORN PLANTER.—D. Broy, Canton, Mo.

I claim, 1st, The combination and arrangement of the forked bars or boards A and B, plates, C and D, channels, H, slide, F, cap or block, G, and seed box E, with each other, substantially as herein shown and described, and for the purpose set forth.

2d, Forming the upper edge of the partition, I, that separates the channels, H, from each other, sharp or wedge-shaped, substantially as herein shown and described, and for the purpose set forth.

76,710.—BROOM.—J. Buercky (assignor to himself and J. C. Bandtel), Overpeck's Station, Ohio.

I claim the combination of the rod, b b, link, d, nuts, c c, bent wires and band, f f' and g, with the perforated ferrule, e, and handle, A, when the parts are constructed, arranged, and applied for securing the wisp, B, in the manner and for the purpose described.

76,711.—SHIFTING-BUCKET PROPELLER.—Jacob Busser, Philadelphia, Pa.

I claim the arrangement of the frames carrying the shifting buckets upon the bottom of or underneath the boat, so that both series of buckets shal

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work in the same plane, and guarded, guided, and shifted for changing the direction of the boat by devices, substantially such as set forth and described.

76,712.—WATER ELEVATOR.—Wm. H. Castle, Washington city, D. C.

I claim the combination of the slot, L, in the crank head, the spring, M, the tooth, N, cap, O, and toothed wheel, Q, when constructed and arranged as and for the purpose set forth.

76,713.—ANIMAL TRAP.—J. J. Cline, High Hill, Ohio.

I claim the combination of the door, D, rod, E, and lever, F, as arranged with door, N, rod, H, lever, G, and cord, K, for forming a self-setting trap, as and for the purpose herein set forth.

76,714.—PLOW.—G. W. Cole, Canton, Ill.

I claim. 1st, The adjustable cap, a, secured to standard, b, as described, and operating substantially as set forth.

2d, The segment-faced shoe, f, working on plate, g, as described, in combination with the cap, a, or equivalent attachment, arranged substantially as and for the purposes set forth.

3d, The combination of the vertical and lateral adjustment of the beam, when the different parts are constructed and operated substantially as set forth and described.

76,715.—CAR BRAKE.—G. W. Combs (assignor to himself and J. B. Murray & Sons), Canandaigua, N. Y.

I claim, 1st, In combination with the wheels, B, the intermediately placed brakes, C C, connected by a toggle joint, D D, and beam, E, suspended upon the slotted hangers, F, and so arranged in relation to the track that when the cars are thrown from the track, the weight of the car shall be applied to press the brakes against the wheels, substantially as set forth.

2d, The combination of the beams, E and E', arms, G and H, spring, G, lever, I, spring, K, and pin, K1, for automatically disconnecting a car when thrown from the track, substantially in the manner set forth.

3d, The combination of the draw bar, L, jaw, M, spring, K, and pin, K1, and arm, K2, arranged to operate substantially as and for the purpose set forth.

76,716.—LAMP BURNER.—Henry Coulter, Philadelphia, Pa.

I claim springs, h h h, so constructed and connected to a lamp chimney holder as to retain upon the same either a swelled or a cylindrical chimney, as specified.

76,717.—VENTILATOR.—R. T. Crane, Chicago, Ill.

I claim, 1st, The cold-air pipe, B, in combination with the hot-air pipe, A, substantially as and for the purposes specified.

2d, The air pipe, B, in combination with the pipe, A, and register, C, substantially as and for the purposes specified.

3d, Providing the hot and cold-air flues, A B, with a register, so constructed and operated that when one flue is closed, or partially closed, the other will be correspondingly opened, substantially as and for the purposes specified.

4th, The deflector, E, in combination with the register, C, constructed and operating substantially as and for the purposes specified.

5th, The deflector, E, constructed and operating substantially as and for the purposes specified.

76,718.—VENTILATOR.—R. T. Crane, Chicago, Ill.

I claim the projection and opening, B, provided with the netting, g, and curtains or valves, b, in combination with the pipe, A, substantially as and for the purposes specified.

76,719.—INKSTAND.—Samuel Darling and John E. Hall, Bangor, Me.

We claim, 1st, A swinging pen rack, so combined with the cover of an inkstand that the movement of the rack will operate the cover.

2d, The combination, with an inkstand and its cover, of a pen rack, or its equivalent, in such manner that the mere weight of the penholder, when laid down by the writer, shall cause the ink to be covered, and that the ink shall be uncovered when the pen is taken up.

76,720.—HEMMER.—E. P. Davis, North Attleboro, Mass.

I claim the combination of the plates, b and c, formed as shown and described, with the arm, A, as and for the purposes set forth.

76,721.—SHINGLE MACHINE.—J. P. N. Davis, Point Arena, Cal.

I claim, 1st, The combination and arrangement of the clamps, H H, for holding the shingle, the curved pivoted knives, I I, and the wedge, b, for graduating the distance between the edges of the same for tapering the shingles, substantially as described.

2d, The combination and arrangement of the rod, K, and lever, M, for releasing and delivering the finished shingles, substantially as described.

3d, The double delivery trough, L, divided by the vibrating diaphragm, g, in combination with the cam, S, arms, T and U, and pin, d, for operating the same, substantially as described.

4th, The bar or rod, i, in combination with the vibrating diaphragm, g, for reversing every alternated shingle on its way to the packing box, substantially as described.

5th, The sliding packing box having movable partitions, in combination with the inclines, m m, levers, n and r, latch, t, and spring, z, for operating the same, substantially as described.

76,722.—PRINTERS' CHASE.—Robert Dick, Buffalo, N. Y.

I claim, 1st, The construction and use of a sufficient number of suitably inclined planes, formed along the side and foot of otherwise common chases, employed in combination with thin wedges of any suitable substance, operating between these inclined planes and a reglet of suitable material, so as to lock up a form in an eighth of an inch chase room as easily and as efficiently as in two inches of chase room, all constructed and operating in combination substantially as set forth.

2d, The flanged coin or wedge, constructed and operated substantially as set forth.

76,723.—SHUTTER FASTENING.—Bartlett Doe, Boston, Mass.

I claim, 1st, The manner of uniting the two halves of the cylindrical case, by means of a ligature applied between the ends of the shell, and at a place of less diameter than said ends, substantially as described.

2d, Also giving to the lower part of the case the rounded and depressed form shown and described, for the purpose of shedding the rain, as described,

3d, Also constructing the upper half of the shell with the opening, f, substantially as and for the purpose set forth.

76,724.—THREAD WINDING MACHINE.—Frederick C. Ehrenberg and Theodor Ehrenberg, New York city.

We claim, 1st, The eccentric roller, X, with corrugations or teeth on its periphery, in combination with spool frame, S, substantially as described.

2d, The eccentric roller, X, and its finger, Z, in combination with the stops, Y Y', substantially as described,

76,725.—TABLE LEAF SUPPORT.—Samuel Ehrman, Chicago, Ill.

I claim the arrangement of the plate, C, with its drop latch, D, and slot, E, in combination with the curved arm, A, when provided with a hinge, B, at one end, and notch or shoulder, a, at the other, operating and constructed in the manner and for the purpose specified.

76,726.—CONCRETE BRICK MACHINE.—William Emmons, Sandwich, Ill.

I claim the lid, E, arranged with a lug, P, and to swing on a bolt, C, in combination with lugs, D D D S, and mold, I I, as and for the purpose set forth.

76,727.—HINGE FOR GATES AND DOORS.—D. S. Esten, Monson, Mass. Antedated April 9, 1868.

I claim the upper part, D, provided with a pendent rod, E, passing loosely through the lower part, C, and surrounded by a spiral spring, F, fitting against the under side of the part, C, and held upon the rod, E, by the nut, G, said parts, C D, provided with inclined surfaces and shoulders, a b, substantially as and for the purpose specified.

76,728.—CONSTRUCTION OF EARS FOR CAN AND KETTLE BAILS.—Thomas Evans, Newark, N. Y.

I claim the ear for the bail of cans or kettles formed with corrugations, as and for the purposes set forth.

76,729.—TUBE CUTTER.—John De Galleford, Cohoes, assignor to himself and Wm. E. Marston, Troy, N. Y.

I claim, 1st, A pipe cutter consisting of the C-shaped frame, A, with its rollers, b b, of the screw, B, adjustable block, C, with its rollers, f f, of the spring, D, and cutting tool, E, all made and operating substantially as herein shown and described.

2d, The grooved rollers, f f, when arranged as described, so that they not only serve as supports for the pipe, but also as guides for the cutter, substantially as herein shown and described.

3d, The block, C, when provided with the spring, D, against which the screw, B, shuts, and when fitted loosely around the cutter, E, substantially as described, so that it can yield to projections on the pipe without influencing the position of the cutter, arranged as set forth.

76,730.—SCROLL SAW MILL.—Bernard Demming, Cleveland, Ohio.

I claim, 1st, The frame, H, pivoted at h, and having projecting bolts or pins, e i', working respectively in slots, g f, whereby the frame may be fixed at any required inclination, substantially as specified.

2d, The combination of the saw, S, with the lever, o, and slide, m, the lever being pivoted to the slide, and its inclination being adjustable by means of a pin, p, and nut, a, or some equivalent device, so that, by inclining the lever at different angles to the slide the saw may be caused to rake more or less, substantially as described.

76,731.—OVERSHOE.—Lewis Elliott, Jr. (assignor to L. Candee & Co.), New Haven, Conn.

I claim an overshoe formed from india rubber in the usual manner, and provided with a fabricated upper, A, when the said upper is applied thereto in the manner herein set forth.

76,732.—HYDRAULIC PRESS.—William Ettinger and Horace P. Edmond, Richmond, Va.

We claim, 1st, The placing of the cylinder of the hydraulic press immediately under the head piece or cross beam of the frame of the press, the head piece or cross beam resting directly on the piston.

2d, The retainer, H, formed with two sets of horizontal steps, 1 2 3 4, and sustained and operated substantially as and for the purpose set forth.

76,733.—WOOD LATHE.—Geo. W. Feltes, Carbondale, Ill.

I claim in connection with the two models, L L, arranged and operated as described, the arrangement of a series of revolving shafts, E E', each bearing two cutting instruments, one at each end of the snaft, the shafts being held in a sliding frame which allows the cutters on one end of the series to operate upon a series of sticks parallel to the model, while those on the other end of the series operate on another series of sticks parallel to the other model, whereby any number of spokes, M M M M, may be made simultaneously in a single machine.

76,734.—GRATE BAR.—Addison C. Fletcher, M.D., New York city. Antedated April 3, 1868.

I claim, 1st, A grate bar having cast to or forming part of it, in the rear, a perforated cylinder, C, having an annular projection on one side, and a corresponding recess on the other, the axial line of which cylinder is arranged transversely to the length of the bar, the same forming, in connection with the other bars of like construction, a tubular perforated bridge for the passage of heated air to the fire, substantially as specified.

2d, The application to a grate bar, constructed substantially as described, of a longitudinal tubular portion, A, terminating in a transverse cylindrical perforated structure, C, of bridge like character, and made to form part of the grate bar of an outside lid or valve, B, essentially as and for the purpose or purposes herein set forth.

76,735.—GANG PLOW.—Matthew Finn, St. Louis, Mo.

I claim, 1st, The sliding blocks, c, connecting rods, c1, and sectors, c2, when arranged and employed substantially as herein shown and described, for the purpose of transmitting the draft from the axle to the plows.

2d, The sectors or sector, D, pinion, d, and beams, B', when combined and arranged as herein shown and described.

3d, The hook, d2, and lever, d3, when combined with the beam, B', and sector, D, as described and shown.

76,736.—DOUBLE SHOVEL PLOW.—I. G. Flisher and E. M. Bates, Stark county, Ohio.

We claim, 1st, The adjustable sole, D E, constructed and arranged substantially as and for the purpose set forth.

2d, In combination with the adjustable sole, D E, the slide, g, and the nuts, f h, arranged and operating substantially as and for the purpose described.

3d, The cutters or knives, a a, when used in combination with the shovel, c, substantially as and for the purpose described.

76,737.—DRAFT BAR.—Daniel Foreman and Michael Foreman, Dalton, Ohio.

We claim constructing the draft bar in two equal parts, and so hinging said parts as to leave a space between them, when the same is used in combination with spring, C, staple, d, and clevis, e, all arranged substantially as and for the purpose set forth.

76,738.—CORN PLANTER AND PLOW.—J. H. Frampton, Hopewell, Ohio.

I claim, 1st, The handle, D, composed of two pieces, d d1, hinged together at d2, when used for the purposes set forth.

2d, The combination of the hinged handle, D, with the rod, n, lever, l, and sliding bottom, m, of the seed box, I, when operating substantially as and for the purposes set forth.

76,739.—SHIPPER FOR SHIFTING BELTS.—Thomas W. Frost, Dorchester, assignor to himself and J. B. Kendall, Milton, Mass.

I claim the within described guide, N, formed in one or more pieces, and secured to a sliding bar, M, for giving the belt a latteral inclination, as and for the purpose set forth.

76,740.—WOOD PLANING MACHINE.—O. P. Furman, Addison, N. Y.

I claim the slide G, having inclined ways upon its sides, working vertically in inclined grooves in the sides of the slide, F, in combination with the crank shaft, H, and lever, h, all constructed and operating as herein described, for the purpose specified.

76,741.—ADJUSTABLE SCROLL INDEX FOR GEAR CUTTING MACHINE.—Wm. M. Galusha, Arlington, Vt., assignor to himself and N. H. Batcheller.

I claim, 1st, An index for gear cutting and other spacing machines, consisting of the perforated or marked plate, C, moving on a scroll track, which is provided on the face of the disk, substantially as herein shown and described.

2d, The slotted clamps, D D, when fitted to bolts, b b, which move in a groove, d, as set forth, in combination with the plate, C, as specified.

3d, The index plate, E, when provided with the fixed stop, e, and with the movable stop, F, and when combined with the disk, A, and scroll plate, C, all made and operating substantially as herein shown and described.

76,742.—MOSAIC FLOOR.—G. G. Garibaldi, Buffalo, N. Y.

I claim, 1st, A composition for mosaic work, substantially as herein described.

2d, A mosaic floor, ceiling, or wall, made of the composition, and in the manner substantially as herein described.

76,743.—HAY RAKER AND LOADER.—Geo. B. Garlinghouse and J. C. Moore, Madison, Ind.

We claim, 1st, The contracting apron, when constructed to operate substantially as described and for the purpose set forth.

2d, The guard formed of the bar, K, and fingers, h h h h, when used in the manner and for the purpose as described.

3d, In combination with the above, the mode of lifting the rake and holding it up, in the manner substantially as shown and described.

4th, In combination with the first clause, the wheels, H H' H'', auxilliary wheels, J J and teeth, i i, etc., or their equivalents, when used substantially in the manner and for the purpose as set forth.

76,744.—HOPPER ATTACHMENT FOR WAGONS.—Frank Gerard, Lincoln, Ill.

I claim, 1st, The combination of the hopper, B, formed with sideboards, e, with the wagon box, A, substantially as and for the purpose specified.

2d, The arrangement of the transeverse bar, b, with reference to the rear end of the box, A, and the edge or end, c, of the hopper, substantially as and for the purpose specified.

3d, The arrangement of the hasps, r, staples, r', and hooks, r*, with reference to each other and with the triangular side pieces, e, of the hopper, B, and the box, A, substantially as and for the purpose specified.

76,745.—FIELD FENCE.—J. A. Gromly, Bucyrus, Ohio.

I claim, 1st, The loop, d, when the same is constructed and applied substantially as described.

2d, The combination of the anchor, A, post, B. board, D, and loop, d, when the same are constructed and arranged substantially as described.

76,746.—DETACHABLE COVERING FOR BUTTONS.—Francis H. Gould, Newark, N. J.

I claim a cap, B, provided with a suitable fastening, whereby said cap can be readily attached to or detached from a button, substantially as set forth.

76,747.—HOSPITAL BED.—Edward Gray, Cuyahoga Falls, O.

I claim, 1st, The side rails, A1, with grooves, a, caps, a2 a3, in combination with springs, a1, and bed frame, B1 B2 B3, as and for the purpose set forth.

2d, The bed frame, with parts, B1 B3, having rollers, x x, in combination with part B2, having flat slats, substantially as and for the purpose described.

3d, The middle part, B2, of the bed frame, constructed as described, in combination with rod, b3, arranged as described, as and for the purpose set forth.

4th, The table, S, with the rods, s, in combination with ears, s', and rod, S, substantially as described.

5th, The shaft, C1, with frames, C3 C4, when combined and arranged so as to operate the head piece, B1, or middle part, B2, of the bed frame, or both, in the manner and for the purpose described.

76,748.—TELEGRAPHIC APPARATUS.—Elisha Gray, Cleveland, Ohio.

I claim, 1st, Operating a relay by two-and-fro currents of magneto-electricity, momentarily induced by a disturbance of the main or line current, in the manner substantially as described.

2d, In combination with the receiving magnet or magnets, the electro-magnetic armature, in which a secondary current is induced on the disturbance of the line current, substantially as described.

3d, In combination with the induction apparatus, constructed as described, the polarized relay, placed in a short circuit, and operated by induced currents, in the manner and for the purpose as set forth.

4th, The arrangement of the magnets, B C and B' C', in combination with the magnets, D' D', used in the manner and for the purposes substantially as described.

76,749.—APPARATUS FOR TREATING MILK.—Geo. D. Greenleaf and Darius C. Larkins, Depaulville, N. Y.

We claim, 1st, The cooling pipes B, adjusted in the pan or vat, A, by means of the chains, D, and pins, E, as herein described, for the purpose specified.

2d, The combination and arrangement of the adjustable pipes, B, having central turned-up end, B1, and siphon, B2, the handles, C, and vat, A, as herein described, for the purpose specified.

76,750.—FIREPLACE.—C. B. Gregory, Beverly, N. Y.

I claim the air chambers, m and n, situated between the inner perforated casing, B, and outer casing, A, of a fireplace, and communicating with chambers containing gravel or other suitable granulated material, through which the air must pass prior to entering the firepot, all substantially as and for the purpose herein set forth.

76,751.—FIREPLACE.—W. D. Guseman, Morgantown, W. Va.

I claim, 1st, The projecting front or cap, C, above and beyond the perpendicular line of the front of the grate, substantially as and for the purpose specified.

2d, The sliding blower or screen, E, in combination with the projecting front or cap, C, substantially as and for the purpose set forth.

76,752.—POST-HOLE BORING MACHINE.—W. I. Hale (assignor to himself and W. M. Logan), Ashley, Ill.

I claim the body A, spurs, c, plunger, F, guides, G, and cross head, H, when constructed, arranged, and combined as and for the purpose specified.

76,753.—ATMOSPHERIC CHURN.—Don C. Hall, Hannibal, Mo.

I claim, 1st, The combination of the removable pipes, L, cylinders, C, one or both, pistons, D, lever, F, and supply pipes, H, having valves, I, placed in them, with each other and with the churn A B, substantially as herein shown and described and for the purpose set forth.

2d, The combination of the removable pipes, L, cylinders, C, supply pipes, H, having valves, I, placed within them, and flexible pipe or hose, K, with each other, whether used with or without the interposition of the branched pipe, J, substantially as herein shown and described and for the purpose set forth.

76,754.—SADIRON.—Judson W. Hall, Worcester, Mass.

I claim, 1st, The combination with the rear of the iron, of the concavities, m m, for the purposes stated.

2d, The combinaton with the rear of the iron, of window, e, substantially as and for the purposes set forth.

76,755.—MACHINE FOR POLISHING WOOD.—G. F. Hammer, Cincinnati, Ohio.

I claim the revolving vertical spindle, b, drum, E, the pulleys, B C, belted together, in combination with the cross bead, g, connecting rod, f, crank, e, spur-wheel, d, and worm gear, c, upon shaft, a, all arranged to operate as described.

76,756.—CLOTHES DRYER.—Henry J. Hancock, N. Y. city.

I claim, 1st, The combination of the pivoted frame, B, carrying the laterally extending arms or bars, C, with the bracket, b, on the shaft or rod, A, whereby the arms or bars, when closed together may be brought into nearly or quite vertical position, substantially as herein set forth.

2d, The combination of the clasping device, D, with the supporting rod or shaft, A, and the movable arms or bars, C, whereby the latter, when closed and turned into an upright position, may be retained in such position, substantially as herein set forth.

3d, The arrangement of the laterally extending bracing arms, g g*, upon the clasping device, D, and the bracket, b, of the pivoted frame, B, and with reference to the rod or shaft, A, whereby the apparatus is prevented from turning upon the axis of the shaft, substantially as herein set forth.

76,757.—MODE OF PURIFYING, SEASONING AND PRESERVING WOOD.—Theodore Wm. Heinemann, New York city.

I claim, 1st, The method herein described of purifying, seasoning and preserving wood by first freeing it from substances liable to spontaneous decay, in the manner described, and afterwards impregnating it with any of the substances herein specified, or their equivalents, by means of high steam pressure, substantially as described.

2d, The method herein described of impregnating wood with any of the substances specified, or their equivalents, by means of high steam pressure, when the steam is generated and superheated in the same boiler or retort in which the wood and impregnating substances are combined, and subjected to steam pressure, substantially as set forth.

76,758.—HORSE HAY FORK.—Samuel M. Hoagland, Catawissa, Pa., assignor to Daniel Kostenbander.

I claim the rod d, and spring, E, substantially as shown and described, in combination with the handles, B, of a double-tined hay fork, all as and for the purpose set forth.

76,759.—REED ORGAN.—Frederick Hoddick (assignor to Geo. A. Prince), Buffalo, N. Y.

I claim, 1st, The employment in upright organs of the chambers, B B, interposed between the sets of reeds and the valves, and operating in the manner and for the purpose set forth.

2d, So combining several sets of reeds, E E, with the chambers, B B, that the opening of the one valve, C, in any one chamber, shall act upon all the reeds opening in that chamber, as herein set forth.

3d, Arranging the valves, C C, and the openings, D D, which they cover, in two rows, one above the other, and alternating in position, when combined with the chambers, B B, in such a manner as to economize space, as herein set forth.

76,760.—HORSE RAKE.—Cyrus P. Holden, Worcester, Mass.

I claim, 1st, The tubular head, C, composed of two parts, connected by the yoke, b, in combination with the axle, A, the ratchet, c, and pawl, d, substantially as and for the purpose specified.

2d, The arrangement and combination of the hook, f', and yoke, b, with the tubular head, C, and its teeth, C*, substantially as shown and described, for the purpose set forth.

3d, The tubular head, C, arranged eccentrically upon the axle, A, in such manner as to permit the innermost ends of the teeth, C*, to be passed thro' such tubular head without interfering with the axle, substantially as and for the purpose specified.

76,761.—ICE PITCHER.—Robert Holmes (assignor to Middletown Plate Company), Middletown, Conn.

I claim. 1st, The providing of the bottom of the internal wall, F, with a pendent pin, c, to fit into a step, d, at the center of the upper edge of the base, E, substantially in the manner as and for the purpose herein set forth.

2d, The connecting of the detachable base, E, with the external wall, A, by means of a screw joint, a, when said detachable base is used in connection with the step, d, and the pendent pin, c, at the bottom of the inner wall, substantially as set forth.

76,762.—COACH PAD.—Benj. F. Hooper, Newark, N. J.

I claim the metal sides, b, and body piece, d, constructed and arranged substantially as herein shown and described.

76,763.—METHOD OF PREPARING ACID PHOSPHATE OF LIME. Eben N. Horsford, Cambridge, Mass.

I claim the use of sulphuric acid or oil of vitriol of commerce, purified as above described, to be employed in the manufacture of pulverulent acid phosphate of lime, when such acid phosphate is so manufactured as to contain gypsum or sulphate of lime derived from the phosphate of lime used in making said pulverulent acid phosphate for the purpose of raising bread.

76,764.—LAMP.—Mark W. House, Cleveland, Ohio.

I claim the adapter, B, in combination with the tube, D E, substantially as arranged and described for the purpose set forth.

76,765.—COMPOSITION FOR BILLIARD BALLS AND OTHER ARTICLES.—John W. Hyatt, Jr., Albany, N. Y.

I claim, 1st, My improved method of producing such mixture by first pulverizing the gum, as above described, and then mixing the same with paper pulp, in the manner and for the purpose above described.

2d, I claim the billiard ball, or other article of manufacture, produced from such composition, substantially in the manner and for the purpose above described.

76,766.—MANUFACTURE OF GLASS KNOBS.—E. D. Ives, New Haven, Conn.

I claim a glass knob attached to its socket, shank or whatever it may be, and completed by giving to the said knob a fire surface finish, substantially in the manner set forth.

76,767.—LANTERN.—Allen S. Jackson (assignor to himself and John F. Myers), Kokomo, Ind.

I claim, 1st, In combination with the base and burner of the lamp the flange plate, B', perforated annular plate, F, and annular plate, G, attached thereto at G', arranged to operate substantially as and for the purpose set forth.

2d, A lantern combining in its construction the following elements: A base and lamp, a flange plate, B', perforated annular plate, F, deflecting annular plate, G, ring, G', chimney, L, detachable frame, H H', and top, I, said parts being respectively constructed and arranged in relation to each other, substantially as described.

76,768.—CAR REPLACER.—Samuel S. Jamison, Jr., Salisbury, Pa.

I claim, 1st. The combination of the two inclines, M N, when constructed with cars, m m, n n, on each side, so that they can be applied on either side of the rail, substantially as and for the purposes specified.

2d, In an apparatus consisting of the grooved incline, M, and the smooth incline, N, so constructing the groove, O, that it receives the flange of the car wheel at the lower and expanded end of the groove and guides it gradually toward the rail, finally dropping the wheel upon the rail in the manner described, and without causing the wheel to cross the rail.

76,769.—STEAM ENGINE VALVE GEAR.—Samuel S. Jamison, Jr., Salisbury, Pa.

I claim, 1st, The combination of the slides, M M, blocks, m m N, lever, J, valve stem, I, and cross head, C', when the said parts are constructed and arranged so as to operate the valve gear from the cross head, substantially as described.

2d, The arrangement of the springs, s s, with the blocks, m and N, substantially as specified.

76,770.—ROTARY STEAM ENGINE.—Samuel S. Jamison, Jr., Salisbury, Pa.

I claim the arrangement of the regulating screw, F, spring brace, G, movable abutment, D, and guides, M M, operating in connection with a rotary cylinder, A, in the manner described.

76,771.—PAPER CASK.—John W. Jarboe, Green Point, N. Y.

I claim a cask or vessel of a similar nature, made of paper, having it s head or heads supported by an outer casing, c, and secured to the cylinder or body substantially as shown and described.

76,772.—DEVICE FOR CLOSING THE MOUTHS OF JARS, CANS, ETC.—Edward T. Jenkins, Ravenswood, N. Y. Antedated April 7, 1868.

I claim the combination of the plates, A and D, screw, B, washer, C, and pin, E, for the purpose specified.

76,773.—COMPOUND FOR ROOFING AND OTHER PURPOSES.—Henry W. Johns, New York city.

I claim the combination of asbestos with pigments, oleaginous or resinous matters, or varnishes, or spirits, or ground or powdered minerals, or rubber all substantially as described and for the general purposes set forth.

76,774.—LUBRICATOR.—Erastus Johnson, Wilkins, Pa.

I claim the combination of the valve stem, D, having the head, m, with the neck, l, and stopple, E, having the jaws, e e, all constructed and combined substantially as and for the purpose set forth.

76,775.—APPARATUS FOR MAKING EXTRACTS FROM BARK AND OTHER MATERIALS.—James W. Jones, Cumberland, Md.

I claim, 1st, Introducing at the bottom of a vat, leach tub, or other vessel, a column of water or liquid of any desirable altitude, to increase the force of the upward hydraulic pressure, when the liquid is drawn off at the bottom, substantially as and for the purpose specified.

2d, The combination and arrangement of the vats, leach tubs and other vessels with the troughs or pipes, G and H, and reservoirs, G' and H', substantially as and for the purpose specified.

3d, The combination and arrangement of the leaches, tank, and hose or pipes, when the same are constructed and arranged substantially as described.

3th, The combination and arrangement of the leaches reservoirs, pump, or pipes, when the same are constructed and arranged substantially as described.

76,776.—SLIDE VALVE OF COMBINED HIGH AND LOW PRESSURE ENGINE.—Thomas L. Jones, Natchez, Miss.

I claim the arrangement of the steam ports, a a1 a2 a3, condenser ports, e e', exhausts, i i', valves, g g', and valve, c c1 c2, when the parts referred to are constructed so as to operate substantially as and for the purposes set forth.

76,777.—MACHINE FOR TANNING.—Lewis L. Kelley, Delaware Station, Ind.

I claim the arrangement of the wheel or rack, E F, having a reciprocating or partial rotation within a tanner's vat, as and for the purpose set forth.

76,778.—DRAIN AND WATER PIPE.—Wm. P. Kirkland, San Francisco, Cal., assignor to himself, J. L. Murphy and Edgar W. Murphy.

I claim in the manufacture of drain and water pipes, the use of ropes, cords or strands, dipped in a pitchy or tarry substance, and wound spirally or placed at right angles around a form, for the purpose of obtaining the desired shape and thickness of the pipe.

Also, the use of a filling of oakum or other fibrous material, placed under the strand or cords, substantially as described for the purposes set forth.

76,779.—STOVEPIPE DRUM.—Dallas Knowlton, Liberty, Me.

I claim the combination and arrangement of the partitions, f g h, with the disk, D, and the drum or case, A, its induct, B, educt, C, and plates, c c', the whole being to operate substantially as specified.

Also, the combination and arrangement of the damper, E, with the partitions, f g h, the disk, D, case, A, induct, B, educt, C, and plates, c c', arranged substantially in the manner and so as to operate as set forth.

76,780.—PADLOCK.—Jacob E. Kohout, Brooklyn, N. Y.

I claim, 1st, The stop, K, and spring, L, for preventing retrogade moveme of the key.

2d, In combination therewith I claim the sliding bolts M, and shackle sprin R, all operating together substantially as and for the purposes described an set forth.

76,781.—MACHINE FOR STRAIGHTENING AND ROUNDING SHAFTING.—Frederick H. Laforge and Wm. Geddes, Waterbury, Ct.

We claim, 1st, The obliquely arranged feed rolls, in combination with the pressure rollers, substantially as and for the purpose specified.

2d, The combination of the guide rolls, C, the pressure rollers, B, and the obliquely arranged feed rolls, a' b' c', provided with their respective means of adjustment, all arranged and operating substantially as set forth.

2d, The construction of the pressure rollers and supporting rolls, with beveled or tapering end portions, m m', arranged in relation with the mechanism, which feeds the shaft or rod to the pressure roller, substantially as and for the purpose specified.

76,782.—SHINGLE MACHINE.—Patrick H. Lawler, Rochester, N. Y.

I claim the arrangement of the pawl, I, star wheel, K, spur wheel, W, pinion, P, and its shaft, S, in combination with the crank, C, or its equivalent, and slotted piece, N, operating substantially for the purposes and in the manner herein described.

76,783.—WOVEN FABRIC FOR FLOOR MATTING, ETC.—Isaac Lindsley, Pawtucket, R. I.

I claim, 1st, The method herein described of preparing and assorting straw for weft of, and weaving the same into a fabric.

2d, The woven fabric herein described, composed of a weft of straw, prepared, sorted, woven and finished, as set forth.

3d, The mode herein described of forming the selvedge of a woven fabric, by securing the ends of the weft by one or more rows or courses of machine stitching, as set forth.

76,784.—REVOLVING CYLINDER FOR TANNING HIDES.—Jos. W. Lull, Glen Hope, Pa.

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I claim, 1st, The tanning of leather by means of a revolving cylinder, substantially as described.

2d, The cylinder, A, constructed with the heads, D D, perforated interior head, C, hoops, G G, fastened by coupling, H, door, F, and projecting pins, e e e, substantially as and for the purpose set forth.

76,785.—BED BOTTOM.—J. I Mabbett, Titusville, Pa.

I claim the combination of the slats, h h, constructed as described, and their bands, g g, with the movable arms, D D, cross slats, j j, levers, C C, having pulleys at their tops, cords, f f, and winding shaft, d, the several parts being constructed, arranged and used as specified.

76,784.—MATCH BOX.—Alexander Martin, Basel, assignor to himself and George Ott, Schaffhausen, Switzerland.

I claim the application of the described metal grate to match boxes or walls or any articles whatsoever, for the purpose of lighting friction matches.

76,787.—HORSE HAY FORK.—Anthony M. Martin and John C. Blocher, Bloomville, Ohio.

I claim the horse hay fork constructed as described, having its central tines bent upward, in rear of the bar, J, to receive the end of the pivoted lever, L, bearing the roller, d, said roller adapted to fit under the lower end of the curved slotted brace, B, when the fork is loaded, and withdrawn therefrom to permit the brace to slide by its slot, e, upon the rod, m, in said lever, to discharge the load, as herein shown and described.

76,788.—DITCHING MACHINE.—John Masters, Waukegan, Ill.

I claim, 1st, The pivoted plow, I, when constructed and arranged so as to be adjustable in a horizontal position upon the elevator box, D, at whatever depth in the ground it may be operating, in combination with the elevator box, D, as herein described.

2d, The plow, I, when constsucted with two land sides, i i, the concave double mold board, i, the curved cutting edge, i", and the arms, I' I", substantially as and for the purpose specified.

3d, The wheel, W, rendered adjustable in the manner herein described, when arranged so as to operate in combination with and at the plow point, substantially as and for the purpose specified.

76,789.—GAS REFLECTOR.—Wm. J. McLea (assignor to himself and C. F. Young), Buffalo, N. Y.

I claim the combination of the gas chamber, A, the rod, a, the slide, C, the sliding rod, c, the reflectors, D, and the rubber gas tubes, m, constructed, arranged and operating substantially as and for the purposes herein described.

76,790.—DOOR.—G. M. McMahan, Mount Sterling, Ky.

I claim the combination of the door, D, rods, C R, gearing, w s, arm, a, and spring, m, with the platform, B', posts, n n, hollow supports e e, springs, u u, arched beams, l l, and pin, p, when the said parts are constructed and arranged so as to operate in connection with each other, substantially in the manner and for the purposes set forth.

76,791.—WOOD PLANING MACHINE.—Rufus N. Meriam, Worcester, Mass.

I claim, 1st, The slots, w, in the bed, A, arranged beneath the cutter head, F, to permit the escape of the chips or shavings, substantially as herein set forth.

2d, The arrangement of one or more presser blocks, D* E*, in relation with the molding cutter and one or more side cutters, J, substantially as shown and described, and for the purpose specified.

3d, The curved end portions, b, of the springs, B, arranged to act upon the sliding bearings of the feed rollers, substantially as shown and described and for the purpose specified.

4th, The presser plate, D, formed with a stem, r, and spiral spring, s, arranged in the sleeve, n, and made adjustable upon the slotted bar, C, substantially as and for the purpose specified.

5th, The presser block, E*, constructed with adetachable bearing piece, whose under surface is the reverse of the surface of the molding, and made adjustable vertically and laterally, substantially as herein shown and set forth.

6th, The slide, K*, in combination with the slotted bar, L, screw, b**, and pivoted frame, K, all constructed and operating in connection with the slotted bar, r, to admit of an angular adjustment of the side cutters, J, substantially as set forth.

76,792.—INKSTAND.—George Merritt, Brooklyn, N. Y.

I claim, 1st, the filter plug, M, in combination with the funnel, A1, and with the jump, H, arranged to operate substantially as and for the purpose herein set forth.

2d, The duplicate collars, C D, threaded, the one male and the other female as shown, and arranged relatively to each other and the neck of the orifice, A2, and to the jump, H, or equivalent means of raising and lowering the pressure of the air in the inkstand, substantially as and for the purposes herein specified.

3d, The pen rack, P P1 P2, arranged to lock by its elasticity upon the main body of the inkstand, and to form a hinge for the cover, R, substantially as herein set forth.

76,793.—WEATHER STRIP.—J. R. Mills, Macon City, Mo.

I claim in combination with a weather strip placed underneath a door, and having in its upper surface a groove extending the full width of the doorway and increasing in depth from one side of the doorway to the other, and having a notch or spout in the outer ledge of the groove, at the deepest end, for the purpose of letting the water outward, the elastic band, E, made of rubber or other material and applied to the bottom of the door in such a way as that when the door is shut the free edge of the band shall extend down into the edge of the groove, in the manner and for the purpose specified.

76,794.—HEEL CASING.—John R. Moffitt, Chelser, Mass.

I claim a heel casing, formed of sheet metal, substantially as described.

Also, in combination with a metal heel casing, spurs, o, substantially as and for the purpose set forth.

76,795.—METAL BEAM.—Richard Montgomery, N. Y. city.

I claim, 1st, So shaping and forming the ends of an arch constructed of corrugated metal as that said ends shall coincide with the straight ends of a beam forming a chord to said arch, if superimposed thereon, substantially in the manner herein set forth.

2d, Imparting a curved or irregular line to the folds of a corrugated metal beam, substantially in the manner and for the purpose herein specified.

3d, Indenting or breaking the surface of the folds or corrugations in a corrugated metal beam, substantially as and for the purpose herein set forth.

4th, A bolt, E, having a forded shank, so arranged and disposed as to fit within and between the folds of a corrugated metal beam, at the ends thereof, substantially in the manner and for the purpose herein set forth.

76,796.—WORK STAND.—I. Morris, Clinton, Ill.

I claim, 1st, The groove and socket of the standard, D, in combination with the deflected bars, d d', of the knives, E, substantially as and for the purpose set forth.

2d, The spool spindles, a a, twine box, A B, pin cushion, C, and knives, E, combined, arranged, and operating substantially as set forth.

76,797.—METHOD OF MAKING RINGS FOR RING SPINNING.—Cyrus B. Morse, Rhinebeck, N. Y.

I claim, 1st, As a new method in the manufacture rings, for ring and traveler spinning, forming a finished ring on the end of metal tubes, and then severing the same from the tube itself, as herein described.

2d, Making rings, for ring and traveler spinning, of highly carbonized cast steel, and hardening or tempering at a low heat only the wearing portion or parts of the same, as herein described.

76,798.—SPINNING FRAME.—C. B. Morse, Rhinebeck, N. Y.

I claim the tubular lifting rod support, E, in combination with the slotted bolster and step rails, A B, and with the lifting rail, C, for the purpose of adjusting said lifting rail to and from the center of the machine, substantially as herein set forth.

76,799.—WINDOW BLIND FASTENER.—David B. Mosher and Charles C. Mosher, Seneca Falls, N. Y.

We claim the combination of the shaft and gear, B, gear, with arm attached, C, box or frame, D, link, E, dog, F, rose, G, knob or handle, H, when made substantially as specified, and applied as herein set forth.

76,800.—GATE.—E. M. Naramore, North Underhill, Vt.

I claim, 1st, The spring, J, applied to a pivot gate, and in combination therewith, substantially as and for the purpose described.

2d, In combination with the pivot gate and spring, J, the catch, K, substantially as described for the purposes set forth.

76,801.—HIGH CHAIR FOR CHILDREN.—John Nichols, Gardner, Mass.

I claim the child's high chair constructed as described, having the divided legs removably hinged together, the lower part, D, of which, carrying the box, G, is adapted to be folded up in front of the chair seat, as herein described for the purpose specified.

76,802.—CAP FOR OIL CAN.—Josiah N. Noyes, Center Abington, Mass.

I claim, 1st, The construction of the revolving perforated cap, in combination with the neck of the can or other vessel, substantially as herein shown and described.

2d, The combination of the sealing packing, E, with the cap and the diaphragm, a, substantially as herein shown and described.

3d, The slotted flange, D, in combination with the stop pin, g, as and for the purpose set forth.

76,803.—INDICATOR FOR THE SPRINGING OR BENDING OF RAILWAY AXLES.—Lewis E. Osborn, New Haven, Conn.

I claim, 1st, The lever, C, placed upon the truck acted on by the flange, b, and connected with the pointer, d, to indicate in the manner and for the purpose specified.

2d, The band or ring, D, placed upon the axle, upon which the said axle acts as an eccentric or cam, and connected with the pointer, d, to indicate in the manner and for the purpose herein specified.

3d, The combination of the dial, A, levers, C C, and rings, D D, as a double-acting indicator, in the manner and for the purpose specified.

76,804.—HOLLOW AUGER.—J. L. Parker, Harrisonburg, Va.

I claim the combination in one instrument of the two adjustable dogs, D D, the cutting instruments, G G', when constructed and arranged together as described, the clamp, F, the stop, S, adjustable by means of the set screw, s, the bifurcated stock, A, and the solid head, B, provided with the central opening, O, and the raised bed, C, in which the blades are countersunk, all the said parts being constructed and arranged and operating together substantially in the manner and for the purposes set forth.

76,805.—BREECH-LOADING FIRE-ARM.—Henry O. Peabody (assignor to the Providence Tool Company), Providence, R. I.

I claim, in combination with the breech block, A (operated as described in the reissue Letters Patent granted to me March 13, 1866), a central and rim-firing needle, b B, constructed and arranged substantially as described.

76,806.—CEMENT FOR COATING WOOD, ETC.—Antonio Pelletier, Washington, D. C.

I claim, 1st, The compound, consisting of vegetable fiber, sand or pulverized silicious limestone, caustic or carbonate of lime, Portland cement, oxide of zinc, chloride of zinc, without or with the additional use of silicate of soda, substantially as described and set forth.

2d, As substitutes for oxide and chloride of zinc, equivalent metallic salts, substantially as described and set forth.

3d, As substitutes for Portland cement, or hydraulic cement, the addition of aluminous salts, mineral, and slags, together with oyster shells, gas house lime, dolomite, or similar magnesian limestones, substantially as described and set forth.

4th, As a new article of manufacture, the composition, substantially as herein described and for the purposes set forth.

76,807.—SEWING MACHINE.—T. W. Pepper, New York city.

I claim, 1st, The combination of the sliding clutch, T, with its cams or cam formations, levers, N O, and rod, h, with its feeder, I, for operation in concert with a presser foot, I, as herein set forth.

2d, The combination of the reciprocating shuttle, K, with the feeder, L, needle, and presser foot, I, at the extreme forward end of the table, C, all constructed and arranged as shown and described.

3d, In combination with the shuttle driver, M, at or near the forward end of the table, C, the pinions, d e, and rack, f, substantially as and for the purpose herein set forth.

76,808.—MORTISING MACHINE.—George. B. Phillips (assignor to Alexander G. Hues), Poughkeepsie, N. Y.

I claim the hinged or detachable holder, F, so connected to the standard or frame, B, that it may be removed or turned aside at pleasure, and constructed to receive the shank of the table, or other support adapted to the work, substantially as shown and described.

76,809.—PIN BOOK.—Truman Piper (assignor to Howe Manufacturing Company), Birmingham, Conn.

I claim the herein-described pin book, consisting of the continuous strip of paper, A, having thereon a succession of rows of pins, and folded, and their point ends secured in the manner described, and having combined therewith the inclosing cover, H and I, substantially as herein set forth.

76,810.—SWING SHEEP FEEDER.—Amos Putnam, Vernon, Big Bend Post Office, Wis.

I claim the removable spout, B, hung in open bearings within the opening in the floor, C and provided with flanges on both faces and at both sides, when so arranged that as its lower end is swung to either side, its upper end will cover one part of the opening in the floor, C, whereby hay or other feed is conveyed from said floor, C, into either one of the parallel racks, cribs, or troughs, as set forth.

76,811.—CAR WHEEL.—John Raddin, Lynn, Mass.

I claim, in combination with the felly, c, the tire, d, having a flange, f, projecting over the face of the felly, the felly and tire being bolted together, and having elastic cushions so disposed as to receive the direct lateral strain upon the felly or tire, substantially as described.

Also, combining with the felly and tire, made relatively movable, the elastic cushions, k, placed in recesses in the felly periphery, and bearing, either directly or through the shoes, j, upon the tire, substantially as shown and described.

Also, the elastic cushions or springs, q, placed in the sockets, p, and resting upon seats, s, with means for forcing out the cushion radially, the cushions being surfaced by a cap, o, or bearing directly against the tire, substantially as described.

76,812.—STOVEPIPE ELBOW.—Carl Recht, New York city.

I claim the detached ring, d, in combination with the plain flanges, b c, on the parts, B C, of an elbow, A, substantially as and for the purpose described.

76,813.—PASTRY JIGGER.—Jerome Redding, Charlestown, and John B. Coe, Boston, Mass.

We claim, as a new article of manufacture, a pastry jigger made up of a circumferential marker, b, and a shank, which, while operating as a gage, is notched, so as also to serve as a marker, as described.

76,814.—PROPELLING VEHICLES.—Thomas Rhoads, Fiskilwa, Ill.

I claim, 1st, The arrangement, with relation to the revolving shaft, L, carrying the wheels, A', of the wheels, G H J, pinion, b, and spring, S, as herein described for the purpose specified.

2d, The pawl, h, pivoted to the frame, D, when connected to the lower end of the pivoted lever, e, whereby it is made to engage with the ratchet drum, F, when said lever is drawn back to the extent of its vibration, as herein described for the purpose specified.

3d, The brake lever, d, in combination with the ratchet drum, E, pivoted lever, e, and pawl, h, as herein described for the purpose specified.

4th, The combination and arrangement of the gearing, G H J, pinion, b, spring, S, ratchet drum, E, lever, e, pawl, h, brake, d, all operating as described for the purpose specified.

76,815.—CHURN.—Thomas Rich, Kingston, N. Y.

I claim the twisted blades, C D, when set in reverse direction upon the shaft, B, the outer blades of each series being entire or without perforations, the inner ones being perforated, as shown and described.

76,816.—HORSE-POWER.—M. A. Richardson, Sherman, N. Y.

I claim, 1st, The projecting beam, A, supporting the gearing, D G F H, and stayed by braces, B C, in combination with the removable driving shaft, E, resting in square socket, d, of the spur wheel, and supporting the forked sweep, P, the whole being specially arranged for allowing the displacement of the said driving shaft, as herein set forth.

2d, The cord, g, passing centrally through the top of the driving shaft, and having a swivel, h, beneath, to prevent twisting, when combined with a belt passing around the horse's belly, in the manner and for the purpose specified.

3d, The special construction and arrangement of the apparatus, as a whole, consisting of projecting beam, A, braces, B C, gearing, D G F H, removable shaft, E, forked sweep, P, pulley, J, crank, K, and the spurring cord, g, in the manner and for the purpose specified.

76,817.—CHAMBER VESSEL.—Charles Robinson, Boston, Mass.

I claim the combination of the concave or inclined cover, B, and valve, C with its extension, d, arranged and operating substantially as and for the purpose herein specified.

Also, in combination with the cover, B, the inclined conductor, g, beneath, substantially as and for the purpose herein set forth.

76,818.—HUB FOR WAGON WHEEL.—W. H. Rodeheaver, Miamisburg, Ohio.

I claim the arrangement of the pair of bands, B C, inclosed in a wooden hub, and being provided with flanges, D E, and interlocked lugs, d e, the whole being secured by rivets, in the manner and for the purpose set forth.

76,819.—SHAFT COUPLING.—P. G. Ross, Davenport, Iowa

I claim the spherical-shaped shell, A, with the head, B, cast therein, substantially in the manner and for the purpose as herein set forth.

76,820.—NUTMEG GRATER.—John G. Roth, New York city.

I claim, as a new article of manufacture, the nutmeg grater constructed as described, and consisting of the plate, A, forming the bottom and ends of the grater, the side guide pieces, C, convex perforated grating surface, B, sliding block, D, removable tube, E, and disk, F, all arranged and operating as and for the purpose set forth.

76,821.—FLEXIBLE BIT FOR BRIDLES.—B. L. Rowley, New Britain, Conn.

I claim the double eye, A, when used in combination with the rings, B, chain, C, and ferrule, D, for the purpose and substantially as herein set forth.

Also, the flexible bit composed of the double eyes, A, rings, B, chain, C, ferrule, D, and rubber casing, E, for the purpose and substantially as herein specified.

76,822.—UPSETTING MACHINE.—J. F. Sargent, Tunbridge, Vt.

I claim, 1st, The disk, b, and links, m, or other equivalent devices, constructed and operated substantially as shown and described, in combination with the levers, D, and arms, I, all as and for the purpose set forth.

2d, The block, B, and base, A, combined and forming a pedestal for supporting the mechanism, substantially as shown and described, in combination with the bed plate, H, and levers, D, and arms, I, all as and for the purposes set forth.

3d, The levers, D, formed with arms, I, in combination with the links, m, disk, b, and crank, h, all constructed, arranged, and operating in the manner substantially as herein shown and described.

76,823.—THREADING TUBE.—David Saunders, Brooklyn, assignor to Joseph Nason & Co., New York city.

I claim the threading tool herein described, constructed and arranged substantially as herein set forth.

76,824.—RESTORING OLD LEATHER.—Bruno Schmidt, Hoboken, N. J.

I claim the within-described process of restoring old leather, by subjecting the same to the various manipulations above set forth.

76,825.—PREPARATION OF MANGANATES AND PERMANGANATES.—Bruno Schmidt, Hoboken, N. J.

I claim, 1st, A compound of manganate of soda and chloride of potassium, prepared substantially as and for the purpose described.

2d, The within-described process of treating the residuum obtained in the manufacture of chlorine, substantially as and for the purpose set forth.

76,826.—TRACE CLIP.—Peter Schoonmaker, New Britain, Conn.

I claim, 1st, Securing the hold-back ring to a pin, c, which is fastened in the trace clip, substantially as herein shown and described.

2d, Providing the trace clip with a flange, a, for the reception of the pin to which the hold-back ring is secured, so that the hold-back ring is fastened to the trace clip, substantially as herein shown and described.

76,827.—PIPE STEM.—T. S. Scranton, New Haven, Conn.

I claim a tobacco pipe stem, divided into parts lengthwise, so that said parts may be separated to expose the interior of the tube, substantially as and for the purpose set forth.

76,828.—GAS HEATER.—Phillip Schreyer, New York city.

I claim, 1st, The burner, D, constructed as described, consisting of the corrugated upper tube, e, fitted upon the perforated smaller tube, d, as herein described for the purpose specified.

2d, Making the frame of a gas stove polygonal, so that a series of such stoves can be set close together to produce one large heating apparatus, as set forth.

3d, A gas stove, consisting of the V-shaped uprights, a a, polygonal rim, b, block, c, pipe, C, and burner, d e, all made and operating substantially as herein shown and described.

76,829.—WRISTBAND FOR SHIRT.—S. H. Scribner, Chicago, Ill.

I claim attaching the wristband or cuff to the shirt sleeve so as to form a reversible cuff, substantially as herein specified and shown.

76,830.—PAPER BOX.—H. D. Scudder, Amsterdam, N. Y.

I claim forming the sides and bottoms of a circular paper box of one and the same piece, in the manner herein specified.

76,831.—LAWN MOWER.—S. W. Sears, New York city.

I claim, in a hand mower, the combination of the roller or driver, C, with the concentric gear, r', supporting the frame, A, the crank shaft, d, the shifting sleeve gear, the shaft, E, and the reciprocating cutter bar, D, constructed, arranged, and operating substantially as and for the purposes herein described.

76,832.—MEDICINE.—S. P. Sedgwick, Wheaton, Ill.

I claim the medicine or specific, composed of the ingredients about in the proportion as set forth, for the purpose specified.

76,833.—CAR COUPLING.—David V. B. Smart, Troy, N. Y.

I claim the staple, C, having its ends passing through the sides of the draw head in combination with the sliding coupling pin, B, and the slotted draw head, all constructed and operating as described, whereby, as the staple is raised, the pin, B, is swung by the knob, E, clear of the draw head through the slot, H, as herein shown and described.

76,834.—PAPER FILE.—E. J. Smith and Benjamin H. Cheever, Washington, D. C.

We claim, 1st, The combination, in a paper file, of an adjustable plate, with a base and fixed vertical plate, substantially as and for the purpose set forth.

2d, The adjustable plate, A, with the projecting arms, D D, in combination with the bottom plate, B, and end plate, C, substantially in the manner and for the purpose herein set forth.

76,835.—COOK FORK.—Hiram Smith, Des Moines, Iowa.

I claim the lever, D, pivoted at a, to the shank, B, of the fork, its outer end provided with the thumb plate, G, and pivoted at b, to the rod, E, whose lower end is attached to the slide, F, between the tines, C, all constructed, arranged, and operating as described, for the purpose specified.

76,836.—LAMP.—J. Homer Smith, Brewster Station, N. Y.

I claim, as an improved article of manufacture, the device for preventing the descent of flame in lamps, consisting of the cylinders, B B, mounted in fixed bearings, in the wick tube, and as long as said tube is wide, when the outer surface of the cylinder is formed with serrated ribs, extending entirely around the cylinder, grooves being formed between the ribs, as described, for the purpose set forth.

76,837.—MANUFACTURE OF ILLUMINATING GAS.—John Somerville, and Robert Elsdon, Maidstone, Great Britain.

We claim the use of chalk, limestone, or foul gas lime, for the purpose of removing carbon from the interior of gas retorts without injuring them, in the manner substantially as herein described, while, by the same operation a useful product, namely, quicklime, is obtained.

76,838.—LUBRICATING OIL.—Gideon O. Spence (assignor to himself, A. R. Williams, and J. S. Lathrop), Titusville, Pa.

I claim, 1st, As a new article of manufacture, a lubricating oil, made from petroleum or coal oil, or their products, as a base, combined with the second and third chemical ingredients herein specified, for the purposes set forth.

2d, As a new article of manufacture, a lubricating oil, made from petroleum or coal oil, or their products, as a base, combined with the five chemical ingredients herein specified, for the purposes set forth.

76,839.—SCHOOL DESK.—Edward I. Stearns, Cambridge, Md.

I claim a school desk, with the lid opening towards the seat and occupant, and supported in position, when open, by the cleats, B, or other suitable device, so that what is the under side of the lid when shut is the upper side, for the books to rest upon, when open, substantially as above described.

76,840.—MACHINE FOR CLEANSING AND RENOVATING FEATHERS.—Harvey B. Steele, West Winsted, Conn.

I claim, 1st, The arrangement of the chamber, P, surrounding the inner cylinder, and the cover, H, and slide, E, constructed as described, for the purposes set forth.

2d, The arrangement of the fumigating shaft, C, in combination with the entire double cylinders, A and B, so constructed and regulated by stop cocks that the feathers are first disinfected and afterward steam dried, as herein set forth.

76,841.—APPARATUS FOR MANUFACTURING ILLUMINATING GAS.—Levi Stevens, Washington city, D. C.

I claim, 1st, In combination with the mixing chamber, D, the superheater, E, so that the mixed hydro carbon and hydro oxygen vapors may be superheated before being retorted, substantially as and for the purpose described.

2d, In combination with the mixing and superheating chambers, the arrangement of retorts for retorting the vapors, substantially as described.

3d, The mixing chamber or vessel, L, into which the retorted gas is passed, and into which atmospheric air is forced, and therein mixed with the gas, substantially as described.

4th, In combination with the mixing chamber, L, the cooler, M, so that the cooling shall take place after the atmospheric air is introdnced and mixed with the gas, substantially as described.

5th, In combination with the cooler, M, the purifying chamber, N, furnished with chloride of calcium as a purifier, substantially as described.

76,842.—CAR TRUCK.—Ezra Stiles, New York city.

I claim, 1st, The broad wheels, E E', when arranged in front of the main wheels, B, and having bearings in the bar, D, and springs, I, substantially as and for the purposes herein set forth.

2d, The chain, G, and chord, H, in combination with the broad safety wheels, E E', arranged as and for the purpose herein set forth.

76,843.—CAR BRAKE.—Ezra Stiles, New York city.

I claim the flanged bearing block or brake block, E E', when made to extend beyond the lines of the wheels, both outside and inside, as represented, and when combined with and operated by the cam, H, lever, H', and spring, G, and chain, I, all arranged substantially as and for the purposes herein set forth.

76,844.—RAILROAD CAR WHEEL.—Ezra Stiles, N. Y. city.

I claim the within-described car wheel, formed of a plate of metal of uniform thickness, by bending and swaging the same in dies, as herein set forth, and having a hub attached thereto, substantially as and for the purpose herein set forth.

76,845.—COMBINED STEAM GENERATOR AND AIR HEATER.—O. M. Stillman, Westerly, R. I.

I claim, 1st, An apparatus for generating steam, and mixing and superheating air and steam, consisting of a furnace, C, a primary generator, B, connected with such furnace by suitable injection pipes, H, and discharge nozzles, n n, and one or more secondary generators, E, arranged and operating together substantially as set forth.

2d, Connecting the furnace, C, with the passages, K, leading to the secondary generator, E, by means of the blast nozzle, n, discharging steam from the primary generator, for the purpose of exhausting the contents of the flue, D, for the passage of gases, and thereby relieving the furnace from pressure, as set forth.

3d, Combining the conducting passage or passages, K, leading to the secondary generator, with the furnace, C, by means of suitable connecting pipes, whereby the products of combustion, in the state in which the same are in the passage, K, can be readmitted to the fire chamber, substantially as described.

76,846.—FRUIT JAR.—Draper Stone, Rochester, N. J.

I claim the annular or flat packing ring, H, constructed and applied substantially in the manner shown and described, in combination with the cover of fruit jars, for the purpose specified.

76,847.—ATTACHMENT FOR CULTIVATOR SHOVEL.—D. C. Stover, Dayton, Ohio.

I claim, 1st, The bearing, C, fitted between the shovel, B, and standard, A, in combination with a slip joint fastening, substantially as and for the purposes described.

2d, The staple, a, fastened to the shovel, B, and the hooked bolt fastening, b b', in combination with the rounded bearing portion, C, interposed between the shovel, B, and recessed standard, A, substantially as described.

3d, So attaching the shovel, B, to its standard, A, that the shovel can be adjusted and set at different angles with respect to the line of draft, without changing the axis of movement of said shovel out of its true line, substantially as described.

76,848.—SULKY PLOW.—B. W. Sutherlen, Freesoil, Minn.

I claim, 1st, The combination of the axle, E, standards, B B, and plow, A, working loosely between the standards, so as to admit of a plow of any construction being suspended by the chains, c c', and drawn by the chain, c", substantially as and for the purpose specified.

2d, The frame, I, in combination with the pulley, G, and lever, L, substantially as and for the purpose described.

3d, The combination of the lever, L, frame, I, pulley, G, chains, c c', and plow, A, substantially as and for the purpose specified.

76,849.—PLATE LIFTER.—S. J. Talbott, Milford, N. H., assignor to himself, James H. Hall, and James H. Gray.

I claim a device for lifting hot dishes, composed of the bars, A A, connected by hinges or joints, a a, with a spring, B, placed between them and each bar having a jaw, C, attached, substantially as shown and described.

76,850.—WASHING MACHINE.—Edward T. Tinch (assignor to himself and George R. Harris), Salem, Ind.

I claim, 1st, The flanged drum, C, provided with latches, b b, and combined with a flexible concave of rolling or rubbing bars, E', and a device for forcibly depressing this concave, substantially as described.

2d, The combination of a lifting cord, d, with a flexible concave, a rotary flanged drum, C, and a device depressing the concave upon the articles being washed, substantially as described.

3d, The construction of the drum, C, with flanges upon its ends, and also with spring latches, b b, for the purposes and in the manner substantially as described.

76,851.—MACHINE FOR RAKING POTATOES.—Daniel J. Tittle (assignor to Abbie M. Tittle), Albany, N. Y.

I claim a root comb or rake, constructed of a number of teeth, A A, of shape shown in fig. 5, arranged in position and secured as described, and operated with a single or crotch beam, B, or its equivalent, and provided with one or more handles, H H, as set forth and described.

76,852.—LAMP FOR VEHICLE.—Chas. F. Waldron, N. Y. city.

I claim, 1st, The annular internal plate, C, formed with the flange, b, in combination with the lower portion or edge of the body, A, substantially as and for the purpose herein set forth.

2d, The annular nut, D, in combination with the base shell, B, and internal plate, C, substantially as and for the purpose specified.

76,853.—APPARATUS FOR BREWING, MALTING, ETC.—Andrew Barclay Walker, Warrington, England.

I claim, 1st, The general construction and arrangement of the apparatus for attemperating air, as described, and illustrated in figs. 1 2 4, and 6, of the accompanying drawings.

2d, The construction and arrangement of the apparatus for preserving yeast or worts in gyle-tuns, as described and illustrated in figs. 2 and 3, of the accompanying drawings.

3d, The means employed for preserving yeast in the troughs or receivers, as described and illustrated in figs. 5 and 6 of the accompanying drawings.

4th, The construction and arrangement of the apparatus for attemperating the atmosphere in malting rooms, gyle-tun rooms, cellars, etc., as described and illustrated in fig. 7.

6th, The construction and arrangement of the apparatus for cooling worts, as described, and illustrated in figs. 10 11 and 12, of the accompanying drawings.

76,854.—KNITTING MACHINE.—Benjamin Ward, Troy, N. Y., assignor to Clark Tompkins.

I claim a claw, comb, or equivalent device, arranged in respect to the needles of a knitting machine, and combined with mechanism for stopping the machine, substantially as described, so that yarn which has fallen or been taken out of the needles will catch on or engage with the claw, comb, or equivalent device, and cause the machine to stop.

Also, in a knitting machine having spring barbed needles, a stripping wheel M, arranged as described, so as to take knots or loose yarn out of the needles, and thereby prevent the injurious retention or accumulation of such knots or yarn in the needles, substantially as herein set forth.

Also, the arrangement in a knitting machine having spring barbed needles of a stripping wheel just forward of the "sinker wheel," or device for feeding yarn into the needles, substantially as herein set forth.

Also, in knitting machines, a series of needles and a stopping mechanism, combined with a comb, or its equivalent, and a stripping wheel, substantially as described, so that yarn taken from the needles by the stripping wheel will engage with the comb or its equivalent, and stop the machine.

Also, in knitting machines, a stripping wheel and a cam, or its equivalent, combined with a circular series of spring barbed needles, substantially as described, so that the cam or its equivalent will press or hold the knit fabric or old loops back on the needles at the place where the stripping wheel is arranged to take waste or loose yarn out of the needles.

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Also, in combination with a series of needles in a knitting machine, a stripping wheel, a cam, or its equivalent, for pressing or holding the knit fabric back on the needles at the point where the stripping wheel acts, a comb, or its equivalent. for engaging with yarn taken from the needles by the stripping wheel, and a stopping mechanism, substantially as herein set forth.

76,855.—WINDOW BLIND.—Chas. H. Warner, Pittsfield, Mass.

I claim a blind, in which the tenons of the slats, a a. etc., are formed of tubes of metal, b b, etc., inserted into the ends of the slats, substantially as herein shown.

76,856.—DRAY.—Edward Warren, and Thomas Brangwin, Ceresco, Mich.

We claim, 1st, The dray shafts, D, provided with a semicircular bowhead. E. in combination with the hinged sections, A and B, of the platform bed of a dray, substantially as and for the purpose specified.

2d, The arrangement and combination of the spring catches F. lock plates, L, cranked tilting cam shaft. T, and spring stop, S, with the aforesaid hinged sections, and pivoted bow headed shafts, substantially in the manner and for the uses set forth.

76,857.—BOOM GEAR.—Charles R. Webb, Philadelphia, Pa.

I claim the slides, A A', or their equivalents, interposed and properly secured between a vessel's saddle, E, and the forward ends of the jaws, C C', for the purpose of preventing the jaws from chafing the saddle, substantially as herein described and for the purposes set forth.

76,858.—HORSE COLLAR.—Eugene Webber, Portage, Mich.

I claim the metallic boxes, B B, with elongated slots, a a, and shanks, b b, as constructed and arranged for fastening the collar in the manner as described and shown.

76,859.—CHIMNEY CAP.—Henry J. Weed, Cazenovia, N. Y., assignor to himself, E. S. Card, and F. Carpenter.

I claim providing chimney caps or smoke stacks with two or more rows of draft openings, arranged one above the other, the spaces between the openings being struck up to form inclines, b, the part above said openings being struck out, and the part below struck in, whereby said openings are transformed into elliptical holes, a a, as herein shown and described.

76,860.—COTTON OR HAY PRESS.—J. Wentz, Girard, Ala.

I claim, 1st, The movable cotton box, A, with its slot. e. substantially as shown and described, in combination with one or more toggle bars, E, and capstan power, as and for the purpose set forth.

2d, In combination with the movable box, A, having slots, e, and with the toggle bars, E, the followers, E, when provided with projections, d, all constructed, arranged, and operating as and for the purpose set forth.

76,861.—BELT STUD.—David M. Weston, Boston, Mass.

I claim, 1st, Rendering the heads rigid, by swaging or compressing them, substantially as described.

2d, Forming the heads with a rounded or convex surface. e, as herein set forth.

3d, A belt stud, having a soft or yielding bar, b, and rigid heads, e, constructed substantially as shown and described.

76,862.—CLOTHES DRYER.—Miles B. Wheaton, N. Y. city.

I claim the frame, a b, with the two pairs of legs, c g, one pair provided with knuckles, i, the other resting against the rungs, b, to admit of the parts being folded parallel, as shown.

76,863.—BOLT TRIMMER.—Aaron B. White, Mendon, Mich.

I claim the combination of the levers, d d', having stops, J J, thereon, with shear-levers, a a, straps, b b and f f, all constructed, arranged, and operating substantially as described.

76,864.—STREET LETTER-BOX.—Daniel White and George H. White, Chicago, Ill.

We claim, 1st, The street letter-box, A, of the shape as described, with projecting and pointed roof, B, and the sides narrowed toward the bottom, provided with movable bottom forming door, D, the joints between said door and box protected by cornice, G. the whole arranged and operating substantially as herein set forth and specified.

2d, The inside guides or flanges, d d, of the openings, C C, arranged and operating substantially as set forth, and for the purpose specified.

3d, In combination with the above, the ears, H H, loops or staples, I I or K K, and brace, L, substantially as herein shown and described.

4th, The sexagonal or octagonal letter-box, constructed as shown and described, provided with six or eight openings for letters and newspapers, and securely placed on an iron stool, the same being secured to the floor or sidewalk, substantially as set forth.

76,865.—COMBINED PLANTER AND MANURE DISTRIBUTOR.—Benjamin F. Whitner, Madison, Fla.

I claim, 1st, Making one of the flanges, h2, of the cylinder, H. movable, and securing it in place, clamping the jointed recessed ring. I, between it and the stationary flange, h', by means of the nut, J, screwing upon the said cylinder, H, substantially as herein shown and described, and for the purpose set forth.

2d, Adjustably securing the hopper, F, in place within the hopper, E, by means of bolts and set-screws, substantially as herein shown and described, and for the purpose set forth.

3d, The combination of a removable weight, K, with the covering-drag, J, substantially as herein shown and described, and for the purpose set forth.

4th, The discharging hopper, M, constructed in two parts, in substantially the form herein shown add described, and a ustably secured to the under side of the frame, B, as and for the purpose set forth.

5th, The stirrer-shaft or cylinder, N, having radial arms, n1, and side arms, n2, attached to or formed upon it, in combination with the peculiarly-shaped hopper, M, and with the frame, B, substantially as herein shown and described, and for the purpose set forth.

76,866.—FOOT-SCRAPER.—Wm. L. Williams, N. Y. city.

I claim, 1st, The brushes. h, jointed to the swinging arms, f, and acting in the manner and for the purpose specified.

2d, The swinging brushes, h, in combination with the swinging arms, f, scraper, b, and brushes, E, substantially as and for the purposes set forth.

76,867.—FERRY BRIDGE.—A. C. Willson, Green Point, N. Y.

I claim, for elevating or depressing the bridge at will, the variable float, C, constructed and operating substantially as herein described.

76,868.—HORSE HAY FORK.—Franklin M. Willson (assignor to himself and Isaac G. Dundore), Whitney's Point, N. Y.

I claim, 1st, The combination and arrangement of the compound detachable rod, G, with the tines, L L, opening from and closing into the recess, D, so that, when closed, their points will meet near the pointed end of the point, B, and when opened or expanded. will operate as herein described.

2d, Constructing the sheath, A, with the detachable pointed end, B, in combination with the spring, J, tumbler, I, pin or key, F, hole, P, and joint-pin, C, all being constructed substantially as herein described and represented, for the purpose set forth.

76,869.—MODE OF TREATMENT OF FOOT-ROT AND OTHER DISEASES IN SHEEP.—George Wilson, New Lexington, Ohio.

I claim the above-described mode of treating diseased sheep having "foot-rot," "dry decay," "scours," etc., i. e., by extirpating the biflex canal, in the mode and by the process herein described.

76,870.—CLOTHES-SPRINKLER.—William V. Wilson, Philadelphia, Pa.

I claim, 1st, Constructing a clothes-sprinkler with a perforated pipe, E, substantially as and for the purpose specified.

2d. The combination of the pipe, E, and plate, C, when the same are arranged substantially as described.

3d, The combination of the pipe, E, and top plate, F, when the latter is so constructed that only a portion of the same is perforated, substantially as and for the purpose specified.

76,871.—WAISTBAND FOR WEARING APPAREL.—Zadig Wolfsbruck, New York city.

I claim the waistband for drawers, provided with the adjustable fastening device, consisting of the tapes, F F', G G', H H', passing through suitable pockets therein, and fastened thereto by means of hooks, B E', and eyes, a a a, as described heretofore.

76,872.—PAPER-FILE.—Edmund W. Woodruff and George C. Green, Washington, D. C.

We claim, 1st, A file, for holding papers or other similar articles, with hinged joints, so that it may be folded together when not in use, substantially as set forth.

2d, A paper file, with the clamping device so arranged that the clamp lever will turn backward or forward, for the purposes specified, without being detached from the file, substantially as shown.

3d, Attaching the file-board to the lever-clamp with a hinge, or its equivalent, substantially as shown.

76,873.—BOLT AND RIVET MACHINE.—George Worstenholm, Newark, N. J.

I claim the feeding-slides, h, and wedge-blocks, g, in combination with screw, l, and pin, k, that presses the rod, i, upwards to hold it while being fed to the machine, substantially as shown.

76,874.—HARNESS.—Geo. M. Zell, Waynesville, Ohio.

I claim the combination of the holder-plate, E, having the elastic cushion, J, the link, D, strap, F, and notched plate, B, upon the under side of the shaft, A, all constructed and arranged as described for the purpose specified.

REISSUES.

2,916.—CEMENT FOR FIXING DOOR-KNOBS.—Patrick Kennedy, New York city. Patented June 11, 1867.

I claim the application of a cement, which is composed of sand and alum, with or without the addition of copperas, for fastening door or furniture-knob tops to their metal or other shanks, as set forth.

2,917.—RAILROAD CAR HEATER.—Edward H. Ashcroft, Lynn, Mass. Patented May 15, 1866.

I claim a safety car, constructed with a water-space, with one or more showering pipes, and a fusible plug apparatus, arranged substantially in the manner, and so as to operate with respect to the car chamber, as specified.

Also, in combination with a water-space, substantially as herein set forth, a heating apparatus and circulating pipes, whereby the water shall be caused to circulate, substantially as herein set forth.

2,918.—FLUID METER.—Napoleon Aubin, Montreal, Canada. Patented August 19, 1862.

I claim the combination of a diaphragm with a reversing apparatus and a slide valve, connected each with the other, without the use of stuffing-boxes. and the whole enclosed within a proper receptacle containing a valve seat, and constituting a fluid meter, constructed and operating substantially as above described.

Also, constructing fluid meters with a single slide valve of such length that it will not cover both of the outside ports in the valve seat at the same time, in combination with a reversing apparatus arranged to throw said valve, while acting upon it, rapidly across the said ports, substantially as and for the purpose above described.

Also, the use, in fluid meter, of a diaphragm, when combined with a short slide valve of the above description, substantially as and for the purpose above described.

Also, the use, in fluid meters, of compression springs, when combined with a short slide valve of the above description, substantially as and for the purpose above described.

Also, constructing the receptacle of fluid meters in two pieces, one-half of which contains part of the side pipe, and the other half the other part thereof, when the joint between the two is made by a diaphragm, and the latter acts upon a reversing apparatus contained in one-half of the said receptacle, substantially as above described.

2,919.—MANUFACTURE OF SUGAR MOLDS AND OTHER ARTICLES.—Theodore A. Havemeyer, I. Laurence Elder, and Chas. F. Loosey, New York city, assignees of Carl Kronig. Patented June 28, 1864.

I claim the process, substantially as herein described, for making vessels and other articles, which process consists in saturating, with linseed or equivalent oil, vessels or articles made of paper, or equivalent substance, in manner substantially as described.

Also, coating articles, which have been made as herein described, and which have been saturated with oil, with a paste of red lead and oil, and then varnishing the same, substantially as described.

EXTENSIONS.

CORN SHELLER.—Thomas D. Burrall, Geneva, N. Y. Letters Patent No. 4,300, dated Dec. 6, 1845; extended seven years from Dec. 6, 1859; reissue 2,083, dated Oct. 10, 1865; again extended by act of Congress (private, No. 102), dated March 2, 1867.

I claim, 1st, The opening, d, in combination with plate or disk, c, and the sheller, substantially as and for the purpose described.

2d, The open space between the lower edge of the sheller and the plate or disk, c, in combination with said plate or disk and the sheller, substantially as and for the purpose described.

IRON CAR BRAKE.—Stephen Morse, Springfield, Mass. Letters Patent No. 10,004, dated Sept. 6, 1853.

I claim the spine, B, having the point of suspension, C, and socket, D, with the open spaces, c c, and brace plates, b b, in combination with the rubber or friction surface plate, A, substantially in the manner and for the purpose as is herein set forth.

APPARATUS FOR COMBINING HYDROCARBON VAPOR WITH AIR.—Oliver P. Drake, Boston, Mass. Letters Patent No. 9,967, dated Aug. 30, 1853; reissue No. 1,819, dated Nov. 15, 1864.

I claim the vaporizing chamber and rotary blowing apparatus, combined in the manner and for the purpose substantially as set forth.

I also claim the combination of the vaporizing chamber and rotary blowing apparatus, under the general arrangement described, with a weight. or its equivalent, acting with a uniform force, so that the pressure at the burner is uniform, whether a greater or less quantity of the mixed air and vapor is burnt.

I also claim the combination of the vaporizing chamber with the mechanical agitator, for the purpose of agitating the liquid during the mixture of the vapor with air, substantially as set forth.

I also claim the combination of the heater and gas burner with the water vessel and vaporizing chamber, substantially as specified, so that by means of the said heater and gas burner and the pipes connecting them with the water vessel and the chamber, the whole or a part of the mixture of air and benzole vapor produced by the apparatus may not only be used in any convenient place for the purpose of illumination, but also for heating the water of the vessel, substantially as set forth.

I also claim the combination of the closed vaporizing chamber, the rotary vaporizer or disseminator (placed therein), and the rotary meter wheel and its closed case, or air forcing apparatus, so made as to force a stream of air into the hollow shaft of the vaporizer and through or against saturated portions of the disseminator and into the vaporizing chamber or regenerator, so as to vaporize the benzole or hydrocarbon and mix it with air, substantially as above specified.

And in combination with the rotating meter wheel and its case, and the hot water vessel, I claim the coiled induction air pipe, as made to pass through the water in the vessel, and thereby receive heat therefrom, so as to warm the air as it passes through the pipe, and to supply oxygen to the volatilized vapors, and for the purpose of facilitating the evaporation of the same.

And in combination with the induction air pipe, I claim the chamber and its regulator slide and orifice, applied for the purpose of supplying cold air to the warmed air, or to the meter vessel, in order to diminish or regulate the temperature of the air passage into the said wheel and forced into the vaporizing chamber.

I also claim the peculiar mode of making the rotary disseminator or vaporizer, viz., of two perforated heads or disks, a hollow perforated shaft and strands of lamp wicking or other absorbent material, stretched from one head to the other, as specified.

SPRING PADLOCK.—Henry Ritchie (assignor to himself, Samuel C. Thompson, and Geo. W. Westerfield), Newark, N. Y. Letters Patent No. 9,963, dated Aug. 23, 1855.

I claim the combination of the bolt, C, guard, E, and the double toothed tumbler, D, one tooth, n, of said tumbler fitting in the shackle, d, and the other tooth, j, fitting in the notch at the back of the bolt, the bolt, guard, and tumbler operating as set forth in the body of the specification.

GRAIN AND GRASS HARVESTERS.—Philo Sylla, Elgin, and Augustus Adams, Sandwich, Ill. Letters Patent No. 10,038, dated Sept. 20, 1853; reissued to C. Aultman & Co., Canton, Ohio, in six divisions, A, B, C, D, E, and F, Nos. 721, 722, 723, 724, 725, and 726, dated May 17, 1859.

DIVISION A, No. 721.

I claim, 1st, An elevated binding table in combination with the platform for receiving the grain as it is cut, substantially as set forth.

2d, The combination with the binding table of one or more binders' stands, on a lower level than that of the table, substantially as set forth.

3d, The combination of a binding table with a binders' stand, having an elevated slide for the binder to rest his legs against, and thereby steady himself without the aid of his arms. both of which are thus left at liberty to do the binding, substantially as set forth.

4th, The arrangement of the rakes and binders' stands, substantially as herein set forth, so that the grain may be raked from the platform and delivered upon the binders' table before the several binders' stands in the manner substantially as set forth.

5th, The arrangement of the dumping tray with the rakes and binders' stands, substantially as set forth.

DIVISION B, No. 722, again reissued May 14, 1867, No. 2,608.

Claim, 1st, The combination of a finger beam with slotted guard fingers, a reciprocating scalloped cutter, a double hinge connection between the finger beam and the main frame, and a driving shaft for the cutting apparatus, parallel, or nearly so, to the ground.

2d, The combination of a double hinge floating finger beam with slotted guard fingers, a reciprocating scalloped cutter, and a removable platform for converting the machine from a mower to a reaper.

3d, The combination of a finger beam with slotted fingers, a reciprocating scalloped cutter, a hinged connection to the main frame, a removable platform, and a reel.

4th, The combination of a finger beam with slotted fingers, a reciprocating scalloped cutter, a hinged connection to the main frame, and arms or levers, or their equivalents, for adjusting the hight of the cutting apparatus.

DIVISION C. No. 723.

Claim. The short finger beam, in combination with the yielding connection with the main frame, or its equivalent, substantially as herein set forth.

DIVISION D, No. 724.

Claim. The combination of the finger beam with the hinges by which it is drawn, arranged above the plane of the cutter, substantially as herein set forth.

DIVISION E, No. 725.

Claim. The combination of a counterpoise weight, or the equivalent thereof. with that end of the finger beam next the main frame, to equalize its pressure upon the ground, substantially as set forth.

Also the combination of a counterpoise weight, or the equivalent thereof, with each or either end of the finger beam, to diminish its pressure upon the ground, substantially as set forth.

DIVISION F, No. 726.

Claim. The combination of a stop with the mechadism for connecting the finger beam with the main frame, and allowing it to rise and fall, substantially as herein set forth.

MACHINE FOR PARING APPLES.—Ephraim L. Pratt. Boston, assignor to James Sargeant and Daniel P. Foster, Shelburne, Mass. Letters Patent No. 10,078, dated Oct. 4, 1853.

I claim hanging or connecting the block, S, which carries the knife to the rod which carries said block, so that the block and knife can vibrate in one or either direction, by means substantially as herein described or their equivalents, so as to allow the knife to vibrate and accommodate itself to any irregularity in the surface of the apple or vegetable pared, substantially as described.

MACHINE FOR GRINDING PLOW CASTINGS.—Joshua Gibbs, Canton, Ohio. Letters Patent No., 10,068, dated Oct. 4, 1863.

I claim the carriage upon which the carriage is fastened, with the weight and grooved stand upon which the carriage is moved, arranged and operated as described.

MACHINE FOR TURNING OR CUTTING IRREGULAR FORMS.—Nathaniel Gear, Marietta, Ohio. Letters Patent No. 10,204, dated Nov. 8, 1853.

I claim the combination of knives in the manner described, with a rotary cutter head, so that said head shall serve as a guide or directrix to the form or pattern carrying the material to be dressed.

MACHINE FOR FIGURING CARPENTERS' SQUARES.—Norman Millington and S. M. George, Shaftsburg, and Abraham B. Granger, Bennington, Vt., and Leland J. Mattison, Cleveland, Ohio, executors of Dennis J. George, deceased, Letters Patent No. 10,136, dated Oct. 18, 1853.

We claim the combination of the revolving chase wheel, W, with the lateral moving anvil, A, by which the relative position of the square to be stamped and the required chase is so regulated that the line of the square to receive the impression is brought under the chase containing the desired figures, substantially as herein set forth.

APPLICATION OF HIGH PRESSURE ENGINES TO SCREW PROPELLERS.—Harry Whittaker, Buffalo, N. Y. Letters Patent No. 10,145, dated Oct. 18, 1853.

I claim the direct application of the crank outside of the hull to side-screw propellers, where such application is combined with or effected by a high pressure engine, arranged also outside of the hull, substantially as herein above set forth.

SPRING CLAMP FOR CLOTHES LINES.—David M. Smith, Springfield, Vt. Letters Patent No. 10,163, dated Oct. 25. 1853.

I claim the above described improved clothes pin, that is to say, I claim the arrangement of the line opening, D, and the spring, C, on opposite sides of the hinge, a, of the two levers, A B, al substantially as hereinbefore specified, whereby by pressure of the longer legs of the levers between the thumb and fingers of the hand of a person the instrument is rendered very convenient of application, without danger during the same of tearing the clothes secured by it on a line.

TRIP HAMMER.—Bernard Hughes, Rochester, N. Y. Letters Patent No. 10,923; dated May 16, 1854.

I claim adding to the stem or rod of the trip hammer, a piston working in a cylinder, open on the upper end and closed at the bottom, and provided with regulating cock and valve, substantially as described. by which means I am enabled to add the whole or such part of the pressure of the atmosphere as may be desirable to the weight of the hammer ingiving the blow.

SCREW NAIL.—Samuel Pratt, Hammonton, N. J.—Letters Patent No. 10,171, dated Oct. 25, 1853.

I claim a screw nail constructed with a thread, shaped substantially as herein described.

I also claim shaping the head, substantially as herein set forth, so that the battering caused by the driving will not obstruct the application of the turn screw.

MACHINE HAMMER.—Daniel Noyes, Abington, Mass.—Letters Patent No. 10,170, dated Oct. 25, 1853.

I claim, 1st, A machine for hammering iron, etc., having the distinguishing feature hereinabove enumerated, viz: a hammer for giving the blow upon the upper surface of the iron acting in conjunction with two hammers which simultaneoously strike the sides of the iron, substantially as above set forth, and I further claim. in a machine for hammering iron, the use of these two side hammers, operating as specified, whether used in connection with the upper hammer or without it.

2d, I claim so arranging the relative position of the fulcra of the hammer beams, and the ends of the connecting rods attached to said beams and to the crank shaft and gears from which they derive their motion as to bring the said fulcra and connecting rods in nearly a straight line at the time of giving the blow, for the purpose above specified, the opposite ends of the connecting rods just before giving the blow moving in opposite directions, so as to give a rapid and powerful blow.

3d, I claim causing the anvil to descend from the iron just before the blow of the side hammers, and to ascend just before the blow of the upper hammer, by means of a rod attached at one end to the under side of the upper hammer beam, and at the other end to a tilting arm which embraces the anvil, substantially as above described.

FEED ROLLERS OF STRAW CUTTERS.—Robert Sinclair, Jr., and Richard F. Maynard, Baltimore, Md.—Letters Patent No. 10,238, dated Nov. 15, 1853.

We claim the employment thereon of alternate right and left pins, so arranged as to form a double spiral or screw, said pins being formed substantially as set forth, and operating together so as to prevent the straw from crowding to the right or left, and to compress the straw laterally as it is passed to the knives, and constituting altogether what we denote the double-screw propeller for straw cutters.

MACHINE FOR TRIMMING THE SOLES OF BOOTS AND SHOES.—Charlotte B. Thompson, administratrix of John H. Thompson, deceased, James M. Thompson, and Hosea Q. Thompson, of Holderness, N. H.—Letters Patent No. 10,239, dated Nov. 15, 1853.

We claim a machine in which the sole is trimmed by revolving knives and guided, as fed along by the operator, by an adjustable gage bar, against which the edge of the pattern plate abuts, substantially as hereinabove described.

UNITING SHOVEL BLADES TO HANDLE STRAPS.—L. S. White, administratrix of Jonathan White, Antrim, N.H.—Letters Patent No. 10,244, dated Nov. 15, 1853.

I claim the uniting, by welding, of the iron handle straps to the sheet cast steel blade, in the manner substantially as herein set forth.

COMBINED INDIA-RUBBER AND STEEL SPRINGS.—E. T. Bussell. Indianapolis, Ind.—Letters Patent No, 10,280, dated November 29, 1853.

I claim the fluting a column of vulcanized India-rubber longitudinally, and then so surrounding it with the helical spring, mine being an improvement upon Ray's spring.

SEWING MACHINE.—William Butterfield, Boston, Mass.—Letters Patent No. 11,240, dated July 4, 1854; Reissued to E. Townsend No. 1,600, dated Jan 5, 1864.

I claim separating into two instruments, a presser-foot and a rest cast-off, both operating on the surface of the material to be sewed, the tube or holder hereinbefore referred to, so that the rest cast-off can act independently of the presser foot, as respects its times and extent of motion, substantially in the manner specified.

Also constructing the rest cast off of such a form that it operates and is located in front of the barb of the needle, instead of surrounding it, by which construction it operates in an improved manner, especially when sewing in narrow channels.

Also, making the rest cast off adjustable with reference to the needle, substantially as described,

Also, the combination of a supporting surface crochet needle and presser foot with a rest cast-off, operating substantially as described.

Also, the improvement by which the rest cast-off is rendered capable of adapting itself to any ordinary thickness or variation of the thickness of the fabric or article to be sewed, such improvement consisting in the above described mode of operating it by the spring, F, applied to the carrier lever, E, and made to operate on the lower end of the recess, C, as stated.

Also, the combination of the bobbin holder, U, with the spring, V, the friction disk, R, and the axle on which the holder turns, the same enabling an empty bobbin to be removed from the holder and a full one put in its place without disturbing the connection of the spring with the bobbin and friction plate or disk.

STRIPPING TOP FLATS IN CARDING MACHINES.—Wm. B. Bates, of Mansfield, Mass., administrator of George Wellman, deceased. Letters Patent No. 14,481, dated March 18, 1856, antedated Nov. 25, 1853; reissue No. 2,705, dated July 30, 1867.

I claim, 1st, The combination of the segmental gear and its set rim or locking plate with a pinion and its locking plate or recess, as a device for imparting an intermittent rotation to mechanism from a continuous one, for the purpose of operating the stripping mechanism, or that which moves the cleansing frame from one top card to another, substantially as described.

2d, The combination of said device for producing intermittent rotation with the mechanism that lifts the strips and lowers the top card, substantially as described.

3d, The combination of the said device for producing intermittent rotation with the mechanism that moves the cleansing frame from one top card to another, substantially as described.

4th, Combining and arranging the segmental gear and its set rim or locking plate with the two pinions, each with its locking plate or recess placed on opposite sides of said segmental gear, so as to operate the stripping apparatus and move the cleansing frame, alternately, substantially as described.

5th, The combination and arrangement of the mangle pins or teeth in the arc of a circle directly attached to the cleansing frame, and concentric with its movement, for the purpose of avoiding intermediate gearing, substantially as described.

6th, Mounting the stripper card upon radial arms that have their centers or axes below the stripper card and near the axes of the cleansing frame, substantially as described.

7th, The combination of the cams, X X, with the levers, Y Y, carrying and operating the stripper card, substantially as described.

8th, The combination of the cams, X X, with the lifting rods, Z Z, and the levers, Y Y, arranged to operate in connection, substantially as described.

9th, The combination of the cams, X X, with the chain belts, Q', the chain pulleys, R', and shaft, M, arranged and operating substantially as described.

10th, The combination of the guide, E', on the cleansing frame, with the stationary guide, D', on the frame of the machine, cooperating substantially as described.

11th, The combination of the springs, F', and the pins, E', and lifting rods, Z, and their application to the frame. S, substantially as described.

12th, The mechanism for cleansing the stripper card, arranged and applied substantially as described.

STRIPPING TOP FLATS FOR CARDING MACHINES.—Wm. B. Bates, Mansfield, Mass., administrator of Geo. Wellman, deceased. Letters Patent No. 10,298, dated Dec. 6. 1853; reissue No. 2,706, dated July 30, 1867.

I claim, 1st, The combination and arrangement of a continuously revolving radial arm and pin, or crank pin, and a circular locking plate connected therewith, with a series of intermittently revolving radial working grooves to receive said pin, connected with a locking plate provided with segmental recesses corresponding to said grooves and to the other locking plate, substantially as described.

2d, Combining with the cleansing frame a mangle gear and the mechanism herein described for imparting an intermittent motion to the same, suitably arranged. by which the cleansing frame is moved from one top card to another in any order desired in both directions, and held at rest while the cleansing operation is performed, substantially as described.

3d, So combining and arranging the cleansing frame. the mangle gear, and pinion, and mechanism for giving it intermittent motion, when the motion of the cleansing frame is from one top card to the next but one, that when the pinion passes around the extremity of the series of pins or teeth of the mangle gear to the opposite side of the same, the distance of the point from where the pinion starts to where it stops on the mangle gear will correspond to the movement of the cleansing frame from one top card to the next to it, and thus shift the order of cleansing the top cards when the frame is moving in opposite directions, substantially as described.

4th, Attaching the stripping card to radial arms, so arranged that by the oscillation of said arms the stripping card will be carried beneath the raised top card to cleanse the same, substantially as described.

5th, Forming the working faces of the cams that raise the top cards in separate and detached segments, placed so as to act in succession in combination with a series of projections or working surfaces on the device that raises the top cards, substantially as described.

6th, The combination and arrangement of the several correspondent parts of mechanism, both new and old, so as to form a complete apparatus by which the top cards of a carding machine may be automatically stripped or cleansed, substantially as described.

MACHINERY FOR MAKING BARRELS.—Geo. W. Livermore, Cambridgeport, Mass. Letters Patent No. 10,680, dated March 21, 1854.

I claim, 1st, Forming or shaping the staves previous to jointing them, by passing them through a series of pairs of curved rollers, in the manner set forth and for the purpose described.

2d, The peculiar construction of the carriage of the jointing machine, represented in fig. 5, the bar, g, being made adjustable within the long slots or mortises, in the manner set forth and for the purpose described.

3d, I claim the combination of the cone Q1, with the spring devices, g'', operating as described, for the purpose of guiding the hoop to the barrel and driving it into place, in the manner set forth.

VALVE ARRANGEMENT FOR STEAM HAMMERS.—James Watt, Charlestown, Mass. Letters Patent No. 10,297, dated December 6, 1853.

I claim, 1st, The revolving valve rod, the barrel, g, and the adjustable screw stop, l, constructed arranged, and operating in the manner substantially as described, by which I am enabled at any instant to admit the steam beneath the piston, during any portion of the fall of the hammer, without altering the effective force and length of the stroke.

2d, I claim, in connection with the above, the arrangement for throttling the steam on its way from beneath the piston, by which means I am enabled to regulate the intensity of the blow of the hammer to any degree of nicety or to hold the same suspended above the anvil, in the manner and for the purpose substantially as set forth.

PROCESS FOR PURIFYING FATTY BODIES.—Richard A. Tilghman, Philadelphia, Pa. Letters Patent No. 11,766, dated October 3, 1854; antedated January 9, 1854.

I claim the manufacturing of fat acids and glycerin from fatty bodies by the action of water at a high temperature and pressure.

REPLACING CARS UPON RAILROAD TRACKS.—Lucian B. Flanders, Philadelphia, Pa. Letters Patent No. 10,301, dated December 6, 1853.

I claim replacing railroad cars and locomotives upon the track, or replacing the car wheels upon the rails, in the manner substantially as herein described, viz., by means of flanges, C C', having inclined bottoms, and secured or attached to the rails, when designed to be used, by the lips or projections, b, on the sides, a, of the flanges, said lips or projections clasping or fitting over the rails, the flange, C', being provided with a movable guide, E, which directs or guides the wheels upon the rails, and which guide, by being movable, will act upon the wheels, the flange, C', being adjusted to either side of the rails.

DESIGN FOR STOVE PLATE.—Charles J. Wilson, Cleveland, Ohio. Letters Patent No. 1,349, dated December 4, 1860.

I claim the configuration and arrangement of said ornaments, as herein designated and represented.

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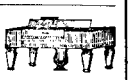

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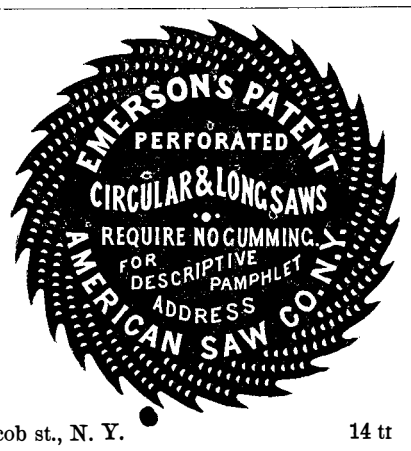

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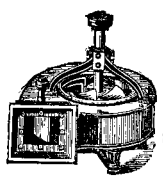

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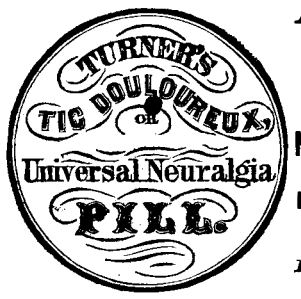

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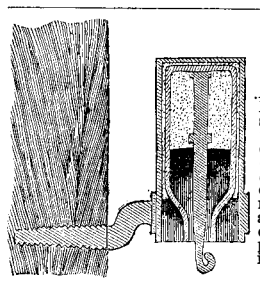

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